ENGINEERING NEWS-RECORD

CONSTRUCTION COSTS

38 pages of 1951 data including new cost index chart supplement

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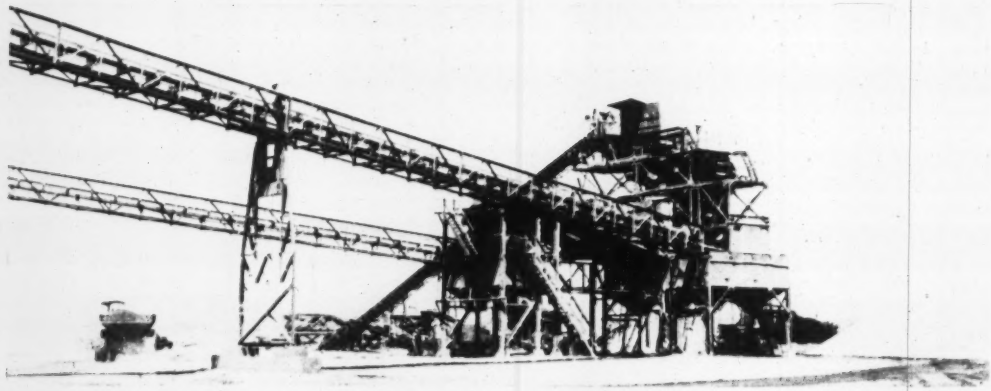

(A) Gravel is processed, and dirt and silt are screened and removed from sand in this washing and classifying plant. From here, the sand and gravel are carried by conveyors to storage piles. Extensive use is made of electric-powered conveyors to provide economical and reliable transportation. G-E motors and control are used throughout the portable arrangement.

ON JOB AFTER JOB

portable plant makes aggregate

... Electrically

G-E Equipment Powers 245-Tons-per-hour Plant to Process Aggregate Wherever It Is Needed.

This portable aggregate and batch plant has now been operated by the Western Contracting Corp. on four projects. Shown here set up near Newman, Calif., to supply aggregate for the Delta-Mendota irrigation canal, the plant has recently been moved to Yuma, Ariz., to do a similar job for the Welton-Mohawk canal. In 1946 the plant was moved 20 miles to the Newman site, set up, and put in operation in 10 days.

General Electric co-ordinated motors and control are used throughout. They give plant operators accurate control of the process, and have cut outages to a minimum. Motors range from 7½-hp G-E Pacific gear-motors driving conveyor belts to a 150-hp rock crusher motor. A 75-hp vertical motor drives a deepwell pump to supply the plant with water.

Electrified construction equipment can pay off for you, too. With co-ordinated use of G-E motors and control and G-E power distribution systems you will get safer, more flexible, and more efficient operation. *General Electric Company, Schenectady 5, N. Y.*

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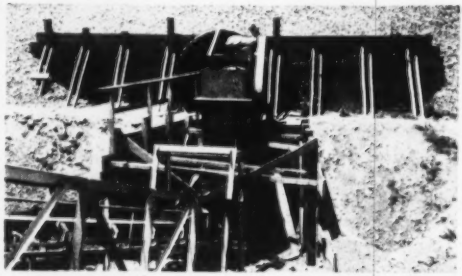
Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.

(B) Oversize rocks are removed by this scalping screen at the beginning of the conveyor system. A G-E 20-hp motor operates the screen. Maximum flow of material to the screen comes from an apron feeder operated by a G-E variable speed motor remotely controlled with a rheostat by the operator at the top of the washing plant.



(C) Gravel is drawn from the storage pile by a conveyor powered by a 10-hp G-E Pacific adjustable-speed gear-motor. This drive permits low adjustable speeds, easily changed by a pilot motor which is controlled from the top of the washing plant.

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Speeds Construction—
Cuts Costs

GENERAL ELECTRIC

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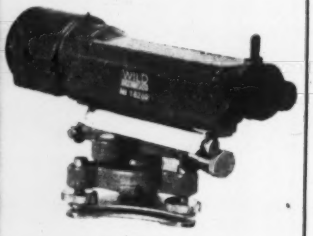
BE ON THE LEVEL



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ENGINEERING NEWS-RECORD

Member

Volume 147 NOVEMBER 1, 1951 No. 18

WALDO G. BOWMAN
Editor

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2 TWO FM-3 WAGON DRILLS,

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THE NEW GYRO-FLOW 600 is the sensational new portable using a *rotary compressor.* Its advanced design—without valves, pistons or clutch—assures a new high in trouble-free performance with minimum attention and maintenance. "Air-Glide Capacity Control" gives smooth, step-less regulation over the entire capacity range. Matched to a powerful GM diesel engine, the Gyro-Flow 600 delivers full 600 cfm at 100 psi, yet weighs only 9500 lbs. ready to run.

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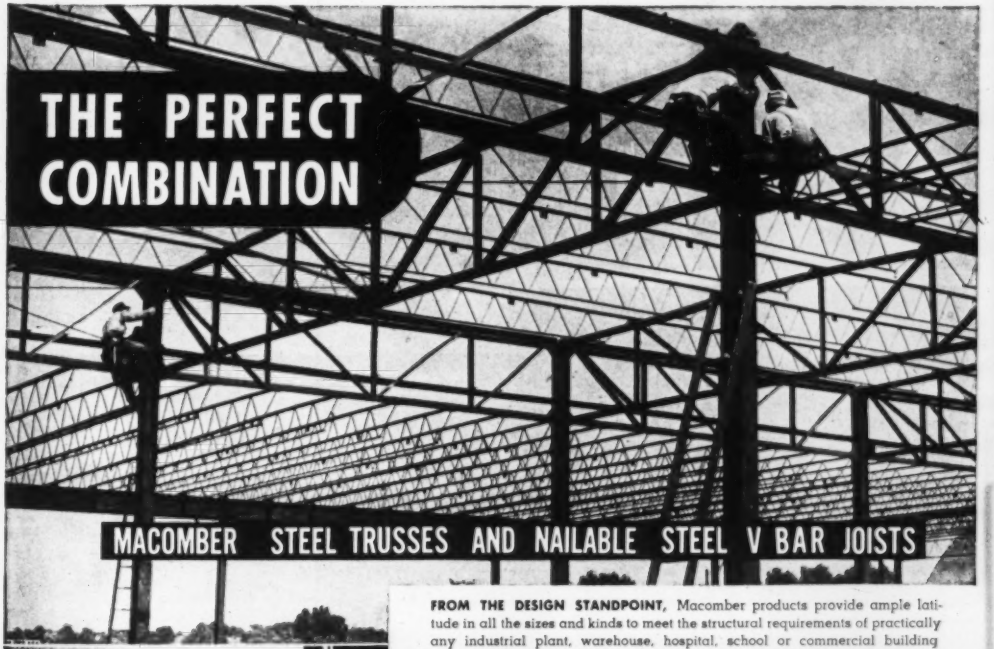

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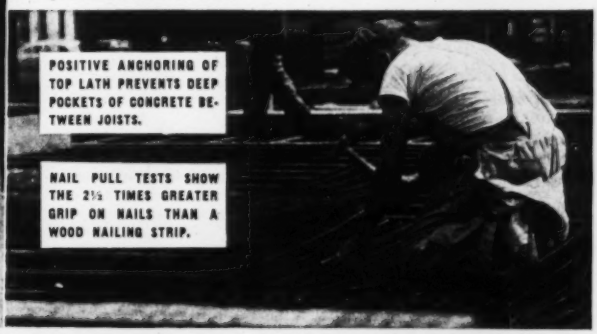
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TEXACO

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6 TEXACO PRODUCTS MAJOR LUBRICATION"

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"The time and confusion saved by the Texaco Simplified Lubrication Plan are incalculable."

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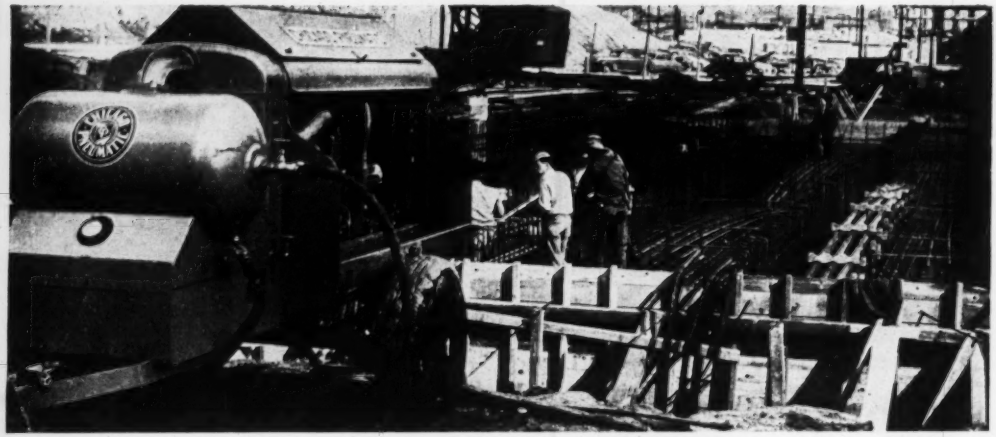

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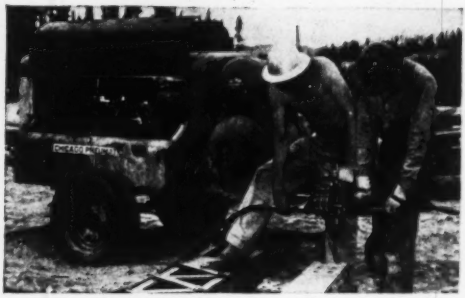
stay on the job



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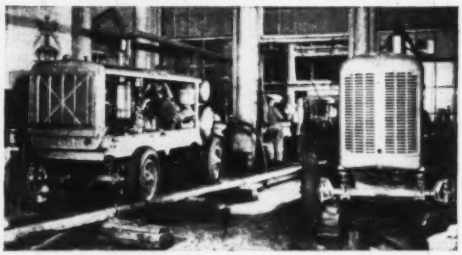

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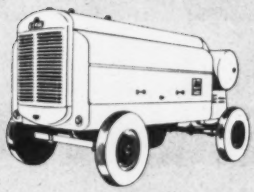

Why LeRoi-CLEVELAND Wagon Drills cut deep-hole costs: — 4-inch bore, powerful force of blow, strong rotation, and thorough hole-cleaning action. Higher drilling speed with big bits. You can drill at any angle — put your holes where you want them for better breakage, lower costs. For shallow holes the new lightweight DR34 unit is your best bet.

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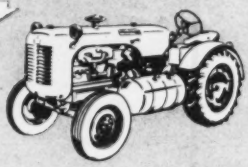

Why LeRoi-CLEVELAND Sinkers drill more feet per shift: Strong rotation, and powerful blow from snappy valve action. Drill more inches per minute. Easy to hold, kickback is reduced. Operators are less tired, drill more feet per shift. Sizes 17 to 82 lbs., including the popular H10 and H111.

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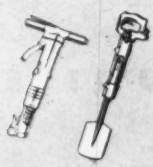
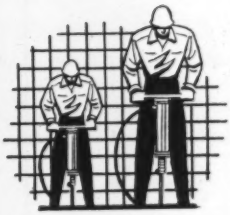


Drilled Per Gallon of Fuel



. . . when you team up with Le Roi Airmaster Compressors and Le Roi-CLEVELAND Rock Drills

Take a compressor that uses less fuel, less oil, and outwears other makes! Take a Le Roi Airmaster Compressor.

Team it up with rock drills that are easier to run — rock drills that have an exclusive valve action for low air consumption, high drilling speed, powerful rotation! Team it up with Le Roi-CLEVELAND drills for more footage per gallon of fuel used—year in and year out.

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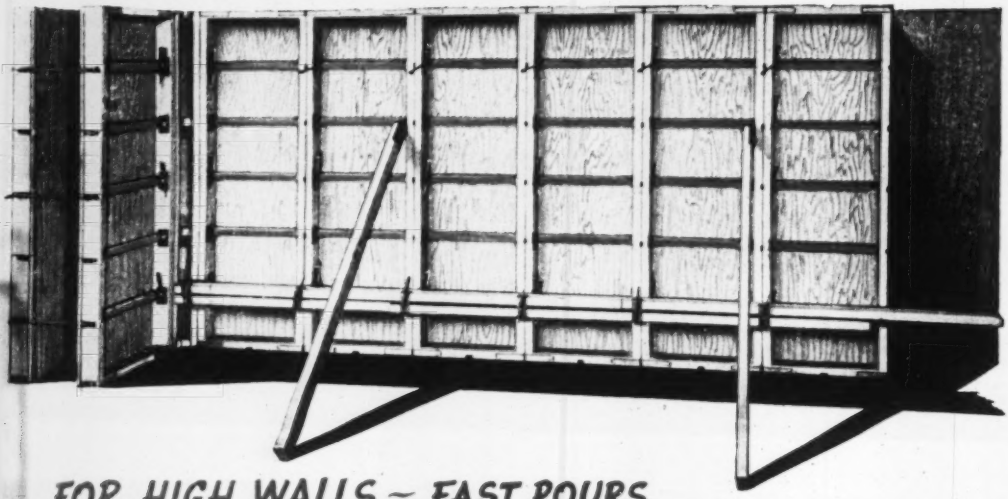
SYMONS FORMS with STEEL RIBS



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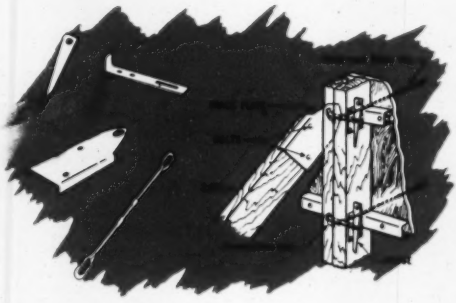
The Symons Clamp & Manufacturing Company will prepare a form layout for your next job without charge. Send in your plans.

Forms may be rented with rentals applying on the selling price.

Sears Roebuck Store, Chicago, Illinois
James Stewart Corporation, General Contractor
Gateway Engineering Co., Concrete Contractor



Symons CLAMP and MFG. COMPANY
4265 West Diversey Avenue • Chicago 39, Illinois

Please send me the items checked:

- ☐ Information regarding Symons Panel Forms
- ☐ Information regarding Column Clamps, Shores, Bar Ties

Name _____

Address _____

City _____ Zone ____ State _____

The first real pipe that is plastic!

For long range economy plus ease of handling and installation, specify CARLON plastic pipe. This remarkable new piping medium brings the inherent advantages of plastics to the field of fluid, vapor and gas transmission. *Guaranteed* against rot, rust and electrolytic corrosion, it has a trouble-free service life many times longer than ordinary pipe.

CARLON pipe has been field-tested and proved superior for drinking water systems, sludge removal, drainage and irrigation systems, ventilating and cooling lines, hydraulic sluicing, and intake and exhaust piping.

Furnished in long, easy-to-handle lengths, CARLON requires a minimum number of fittings, and it can be installed rapidly without special tools or materials handling equipment. A complete line of standard I.P.T. plastic fittings is available for joining lengths of CARLON or for connecting this new pipe to previously installed metallic systems.

At present, raw material shortages are limiting the production of certain types of CARLON pipe. Every effort is being made to overcome this problem and to meet the need for CARLON . . . **the first real pipe that is plastic.**

242-CP

CARLON PRODUCTS CORPORATION

In Canada: MICRO PLASTICS, Ltd., Acton, Ont.
10152 Meech Avenue • Cleveland 5, Ohio

From Boulders

ONE OF SIX INTERNATIONAL TD-24s WORKING ON U.S. 99

to Boulevard

A. Teichert & Sons tackle huge highway job on U. S. 99 in California mountains

Fifty miles north of Los Angeles, A. Teichert & Sons are changing the face of California to modernize the main road to San Francisco.

They're digging into the rough, rocky hills with six Big Red TD-24s . . . charging in with International power to move over a million yards of boulder-filled earth—doze out cuts down to 350 feet deep—reroute a creek channel to eliminate present bridges—turn today's three-lane U. S. Highway 99 into a four-lane traffic-separated superhighway.

Teichert chooses TD-24s for the job because they're the Champs for this grueling, heavy-duty work. Here's why:

TD-24 Power—148 maximum horsepower at the drawbar, more than any other crawler on the market. Moves more dirt per hour.

TD-24 Speed—8 forward speeds, 8 reverse. Moves loads faster, gets out and gets in again faster for a faster work cycle.

TD-24 Operation—Synchromesh transmission, you shift "on-the-go." And you go up or down one speed without declutching.

TD-24 Steering—Fingertip steering for pivot turns, feathered turns, turns with power on both tracks.

TD-24 Starting—Push-button starting in any weather.

Ask your International Industrial Distributor for details on the TD-24. Consider his on-the-job service and complete shop facilities, at your call through the years ahead. Get the whole low-down! You'll be a TD-24 man from then on in!

International Harvester Company, Chicago 1, Ill.

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS

1,200,000 YARDS TO MOVE—and one of A. Teichert's International TD-24s gets at it. Among crawler tractors, the Big Red TD-24 is the Champ, with more power and speed to move more paydirt per day.

Raincoats for structures...

Sprayed, Brushed or Troweled on!

Keep moisture at bay... it wreaks havoc!

Specify Flintkote Protective Coatings . . . for structural steel, exposed concrete, inside surfaces of masonry, insulation materials . . . wherever dampness and corrosion are a problem.

Flintkote Protective Coatings are available in both asphalt cutback and emulsion types, and can be applied by spray, brush or trowel.

Whatever your waterproofing or dampproofing system, choose from mastics, semi-mastics and liquid-asphaltic compounds . . . fibrated, non-fibrated Flintkote Protective Coatings.

Available also are asphalt primers, caulking compounds, membrane reinforcing and spandrel cloth—all of them effective "raincoats" for guarding structures against moisture.

Write for complete specifications and application data on using these efficient materials in both new construction and maintenance.

THE FLINTKOTE COMPANY, *Industrial Products Division,*
30 Rockefeller Plaza, New York 20, N. Y.
Atlanta • Boston • Chicago Heights • Detroit
Los Angeles • New Orleans • Washington
The Flintkote Company of Canada, Ltd., 30th Street, Long Branch, Toronto; also Montreal

FLINTKOTE *Products for Industry*

from penstocks to water mains . . .

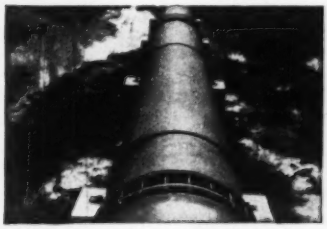
Dresser Couplings absorb pipe movement, prevent built-up stresses, speed construction

75" penstock of the British Columbia Electric Co. One of three installed at Bridge River, using Dresser Couplings specially designed for the job. With Dressers, construction time was cut from months to weeks, due to simplicity of installation. And penstocks have remained bottle-tight under very high pressures, despite severe weather conditions.

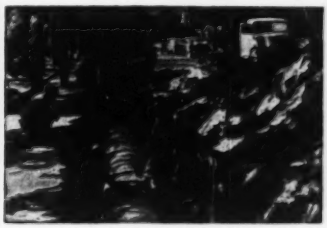
On either exposed or buried lines, from ⅜" to 72" diameter or larger, your best protection against vibration or movement stresses is a Dresser Coupling. Each of these "flexible-tight" joints takes up to ⅜" expansion-contraction movement . . . up to 4° deflection . . . cushions your line at every joint. Specially compounded rubber gaskets soak up vibration like a sponge.

Installation of Dresser Couplings is simplicity itself. Any workman can install them; the only tool needed is a wrench. And fast? On a typical 48" water line, 40 lengths of pipe were laid in one 8-hour day using a two-man joining crew.

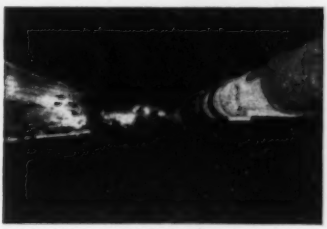
Performance on half a million miles of pipe proves Dresser dependability.



Over swamps and marshy ground, where earth movement must be considered, Dresser Couplings keep Savannah's, new 14-mile, 42" water supply artery completely tight.



In busy streets of Stoneham, Mass., simplicity and ease of installing Dresser Couplings gets the job finished sooner. Dressers absorb traffic vibrations.



Under New York Harbor, construction of the Brooklyn Battery tunnel was simplified by using Dresser Couplings to join air and water supply lines.

DRESSER

"FLEXIBLE-TIGHT"

COUPLINGS

Dresser Manufacturing Division, 319 Fisher Ave., Bradford, Pa. (One of the Dresser Industries.)

GET THESE FOLDERS NOW!

Interesting engineering data on varied types of lines installed with Dresser Couplings. This is file material.

DRESSER MANUFACTURING DIVISION
319 Fisher Ave., Bradford, Pa.

Gentlemen: Please send me your "Report of Dresser Coupled Lines," your "Bridge River" reprint, and "Style 38" catalog.

Name_____
Firm_____
Address_____
City_____ Zone_____ State_____

CONCRETE JOIST
Floor Construction SAVES 4 WAYS
on your Concrete Building!

When you specify *Concrete Joist* floor construction for your concrete building, you save materials, construction time, and cost. Furthermore, reduction of dead floor weight will permit economies in the building frame, too.

In Concrete Joist construction, ready-made, re-usable forms of standard dimensions are used. These forms, easy and quick to erect, are *rented* to the owner or contractor.

Many different ceiling treatments are possible. Joists can be left exposed—either plain or decorated. Or, flat ceilings can be produced with metal lath and plaster, or with suspended acoustical materials. Space between the joists houses pipes and conduit, and serves as insulation. For complete information, write for free booklet—"Reinforced Concrete—A Manual of Standard Practice."

---

1. SAVES CONCRETE
—by eliminating much of the concrete below the neutral axis, which contributes little to floor strength.

2. LIGHTER FRAMING
—because dead floor weight is reduced, making it possible to use lighter framing and foundations.

3. SAVES TIME
—by use of ready-made forms of standard dimensions, which can be placed and removed more quickly.

4. CUTS COSTS
—by saving on concrete and lumber, framing, labor, and construction time.

CONCRETE REINFORCING STEEL INSTITUTE • 38 S. Dearborn St., Chicago 3, Ill.

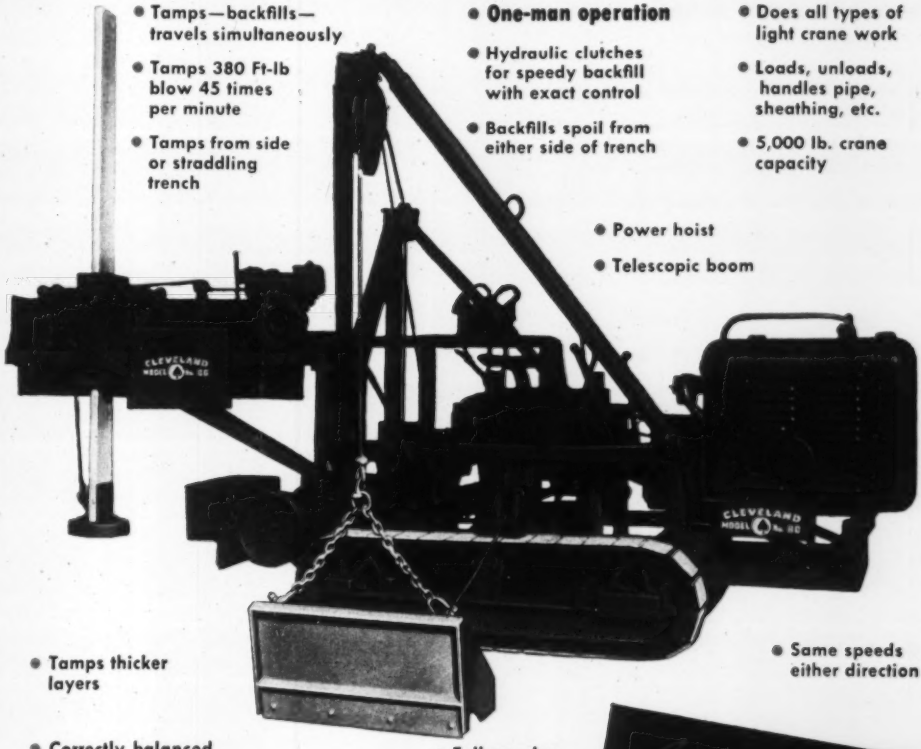
NOW...do all three trench-completion jobs with one machine

CLEVELAND 80

the only machine of its kind!

IT TAMPS! IT BACKFILLS! IT LAYS PIPE!

- Tamps—backfills—travels simultaneously
- Tamps 380 Ft-lb blow 45 times per minute
- Tamps from side or straddling trench
- **One-man operation**
- Hydraulic clutches for speedy backfill with exact control
- Backfills spoil from either side of trench
- Does all types of light crane work
- Loads, unloads, handles pipe, sheathing, etc.
- 5,000 lb. crane capacity
- Power hoist
- Telescopic boom



- Tamps thicker layers
- Same speeds either direction
- Correctly balanced steel backfill board
- Full crawler maneuverability

A MACHINE THAT BELONGS IN YOUR '52 PLANS

Get more work for your budget dollar! The "80" is time-tested and job-proved—for tamping, backfilling, pipe handling and other types of trench completion work. Get complete information on it *now!*

Available Now

Order now for prompt delivery, clean up your back-end problems before winter sets in. The "80" is available 2 ways . . .

SEE YOUR LOCAL DISTRIBUTOR OR CONTACT FACTORY DIRECT

THE CLEVELAND TRENCHER CO. 20100 ST. CLAIR AVE. CLEVELAND 17, OHIO

When economy is vitally important...

that Pioneer Edge

How Pioneer equipment did the job

Aggregate consisting of ¾" and 1½" quartzite arrived in bottom dump cars. It was stacked with a PIONEER reciprocating feeder loading a PIONEER 24" inclined belt conveyor equipped with a swiveled chute at its upper end. This either delivered material directly to a 50 foot rock ladder or to one of the two 115 foot 24-inch belts discharging to rock ladders serving the stockpiles. Capacity was 276 tons per hour.

Three gates under each stockpile delivered aggregate to an 18-inch belt which carried it by an underground-overground conveyor to the batch plant 835 feet away.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

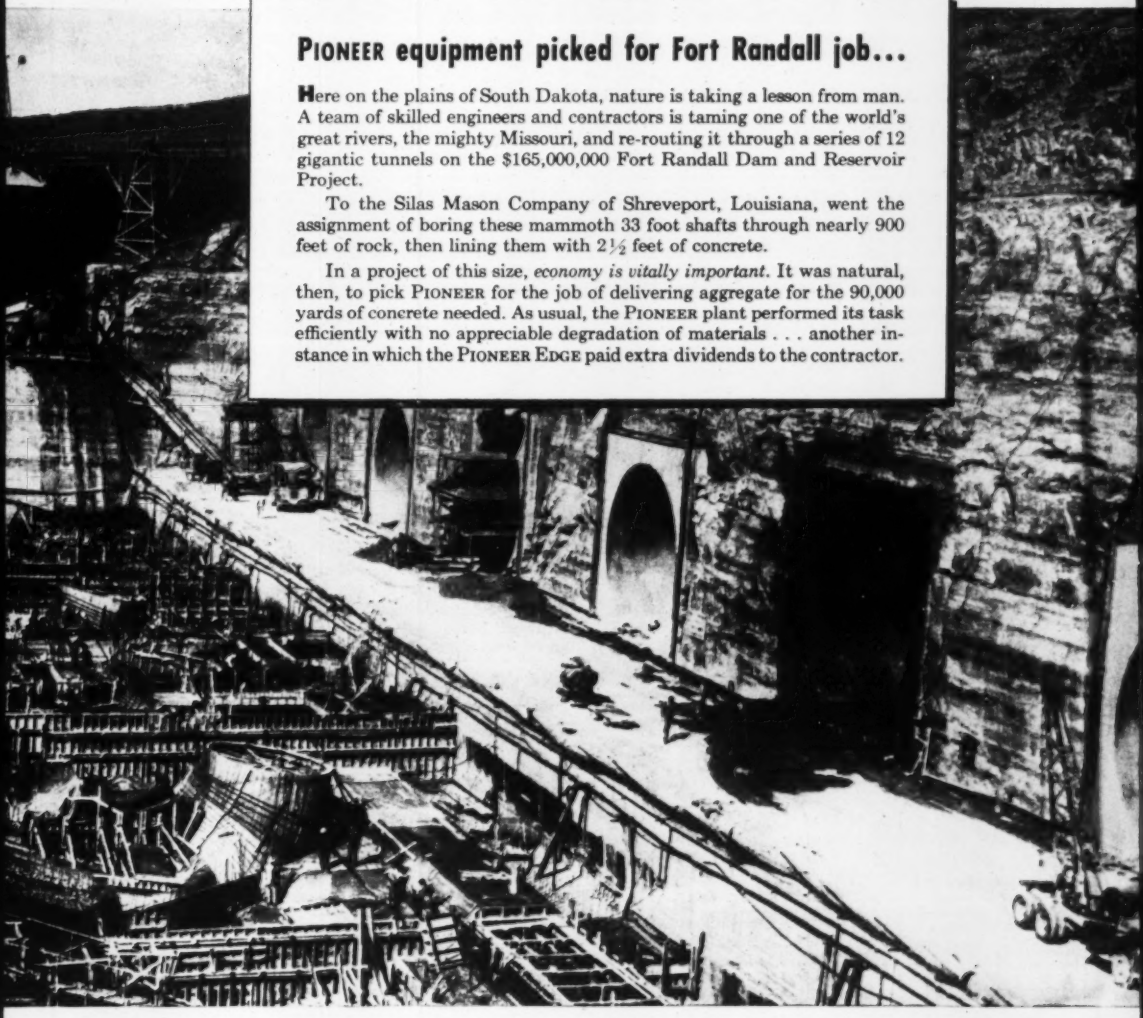
means rock bottom costs

PIONEER equipment picked for Fort Randall job...

Here on the plains of South Dakota, nature is taking a lesson from man. A team of skilled engineers and contractors is taming one of the world's great rivers, the mighty Missouri, and re-routing it through a series of 12 gigantic tunnels on the $165,000,000 Fort Randall Dam and Reservoir Project.

To the Silas Mason Company of Shreveport, Louisiana, went the assignment of boring these mammoth 33 foot shafts through nearly 900 feet of rock, then lining them with 2½ feet of concrete.

In a project of this size, *economy is vitally important.* It was natural, then, to pick PIONEER for the job of delivering aggregate for the 90,000 yards of concrete needed. As usual, the PIONEER plant performed its task efficiently with no appreciable degradation of materials . . . another instance in which the PIONEER EDGE paid extra dividends to the contractor.



What the Pioneer Edge *meant to Silas Mason*

At Fort Randall, PIONEER equipment again showed its exceptional capacity for efficient, low cost handling of sand and aggregate. Especially important was the fact that it eliminated breakage of materials and made it readily possible to adhere to strict government specifications.

"The system functioned economically and we were well satisfied with its performance," reports R. B. Jewell, Silas Mason's Resident Engineer in charge of the project.

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota
SUBSIDIARY OF POOR & COMPANY, CHICAGO

● Please send me information on the equipment checked.

☐ CONTINUFLO CONVEYORS	☐ GRAVEL PLANTS	☐ WASHING PLANTS
☐ MECHANICAL FEEDERS	☐ ROCK PLANTS	☐ BITUMINOUS PLANTS
☐ VIBRATING SCREENS	☐ JAW CRUSHERS	☐ APRON FEEDERS
☐ BUZZER SCREENS (LIGHT DUTY)	☐ ROLL CRUSHERS	☐ ORO FEEDERS

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

HOW DRAVO *Counterflo* HEATERS

*helped a large eastern railroad**

save $159,000.

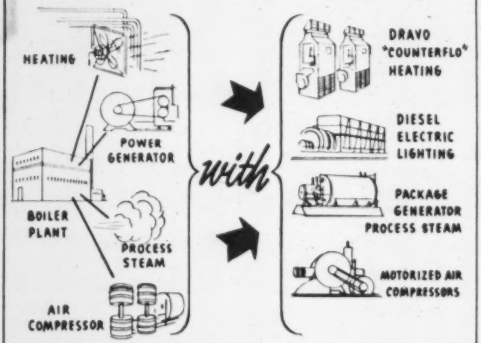
IN ONE YEAR

**Customer's name withheld on request.*

When a large eastern railroad dieselized its locomotive fleet, it not only reduced its road operating expenses, but found substantial savings in an improved method of providing heat, light and process steam for its reconverted shops.

By replacing the old steam power plant which had supplied heat, light, power and compressed air at a cost of $208,600 per year (not counting fuel transportation), the railroad now obtains its utilities for $48,676 per year at this installation. The savings offset the total investment in new equipment in ten months! Savings for the second year of operation amount to nearly $160,000.

HERE'S HOW...IT WAS DONE THIS RAILROAD REPLACED...



DRAVO HEATERS PLAY MAJOR PART IN THESE SAVINGS

These are the advantages the railroad gained through the use of Dravo "Counterflo" Heaters:

- . . . low initial cost . . . savings up to 60% on installation
- . . . concentration of heat at working level
- . . . 150 foot air throw . . . no duct work required
- . . . flexibility . . . units can be mounted in any position, floor, wall or ceiling
- . . . burn gas or oil . . . readily converted . . . low fuel consumption
- . . . automatic control . . . on-off or modulating controls
- . . . long service life, low maintenance . . . stainless steel combustion chamber
- . . . mobility: can be moved easily to any location

Versatile Dravo Heaters are used in nearly every type of industrial installation.

"Counterflo" Heaters are ideal for commercial and industrial use in foundries . . . warehouses . . . machine shops . . . stores . . . schools . . . churches . . . process industries . . . any many others. Why not look into the possibilities of Dravo Heaters for your heating and ventilating needs? Write today for Bulletin No. OP-52 -68

DRAVO CORPORATION

HEATING DEPARTMENT, DRAVO BUILDING, PITTSBURGH 22, PA.

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ATLANTA • BOSTON

Sales Representatives in Principal Cities

Manufactured and sold in Canada by Marine Industries, Ltd., Sorel, Quebec

EXPORT ASSOCIATES, LYNCH, WILDE & CO., WASHINGTON 9, D. C.

NEW Whiteman

MODEL "C" FLOATING AND FINISHING MACHINE

Greater than ever!

POWER! 4 cycle Wisconsin AKN gas engine develops 6 HP.

HANDY Longer lifting bar for greater ease in moving machine around job.

HEAVY DUTY Spider plate of small diameter—heavy, strong and rigid.

NEW HANDLE
Wider handle with comfortable rubber grips gives easier control of machine at all times.

NEW CLUTCH
Double groove clutch transmits more horsepower through two belts. Improved clutch pulley ratio INCREASES TROWEL SPEED 25%.

NEW-5 TROWELS
5 trowels with 10° lead give smoother operation.

NEW GUARD RING
Stationary guard ring permits machine finishing within 1½" of walls, columns, etc.

NEW UNIVERSAL TROWELS
Tool steel trowels can be used for both floating and finishing, eliminating trowel change.

NEW ARM ADJUSTMENT
Individual adjustment on each trowel arm allows perfect alignment of trowels at all times, insuring full 44" surface contact.

CONTROL! Trowel pitch can be adjusted while machine is in motion, a patented exclusive Whiteman feature.

NEW WEIGHT
20% increase in weight helps speed all jobs—especially adapted to patent method and heavy duty floors.

Whiteman
CONCRETE EQUIPMENT

WHITEMAN MANUFACTURING CO.
3249 Casitas Ave. Dept. E, Los Angeles 39, Cal.
Please send me literature and prices on new Whiteman Model C Floating-Finishing Machine and name of nearest distributor.

Name _____

Firm _____

Address _____

City _____ Zone ____ State _____

"I found out early...

"I had not been in business very long before I learned what the choice of a top-flight surety company can mean to a contractor.

"I was bidding on an out-of-state job – the biggest job my company had gone after up to then. Yet as soon as I talked to the Ætna Casualty and Surety Company's men, I knew I had come to the right place. Their underwriters understand a contractor's problems right down to the ground – no matter how complex a job may be. And, when we placed that first out-of-state bid, I found out that Ætna's nationally known and respected name in back of us meant a lot in getting favorable recognition.

"Since then, my associates and I have bonded many hundreds of contracts with Ætna – and have always been glad we established that company as our surety early in the game. In emergencies – when a filing deadline is close – Ætna's coast-to-coast facilities and prompt service can make a big difference. And always – Ætna's thorough understanding of the business and the unquestioned respect that the name carries are important assets for the contractors they bond."

Coast to coast . . . you can count on
The Ætna Casualty and Surety Company
for prompt, efficient contract bond service.

"No Job too Big... No Job too Small"

ÆTNA

ÆTNA CASUALTY AND SURETY COMPANY

The Ætna Life Affiliated Companies write practically every form of insurance and bonding protection

LIFE AND CASUALTY
Ætna Life Insurance Company
Ætna Casualty and Surety Company

FIRE AND MARINE
Automobile Insurance Company
Standard Fire Insurance Company

Hartford 15, Connecticut

NEWS BRIEFS

• **Scrap over scrap**–Although at the present time there is a great demand for metal scrap, Philadelphia has started to cover up about 10,800 ft of abandoned trolley rails on Wyoming Ave. Paving over the rails is costing only $8,400 against an additional $18,000 if the rails were first removed. Both the city and the Philadelphia Transportation Co. say they can't afford to remove the rails as the cost is far more than dealers will pay for the scrap, and the federal government won't keep for the same reason.

• **Clerical errors lose bids**–Because of an oversight a Canadian construction firm lost out on the $1,750,000 runway extension job at the Vancouver International Airport. The firm was the lowest bidder but it failed to deposit a check for 10 percent of the amount as required. The elevator contract for the $1,300,000 library and law school building at the University of Toledo was not awarded to the Otis Elevator Co., low bidder, because while it deposited a certified check for $1,500 as a bond, the check was made out to the University of Michigan instead of to the University of Toledo. The last of three comedies of error is the case of a sole bidder on an estimated $18,000 drainage job for the Ohio highway department at Huron, Ohio, whose special delivery letter containing his bid arrived just after the deadline in Columbus, and was returned to him unopened.

• **Expensive overload**–A Chicago truck owner and drived were fined $1,040 and $15 costs on a charge of overloading their vehicle by 10,400 lb. This is the highest penalty imposed for this type of violation thus far in the state and the first conviction in Cook County under the new state law providing heavy penalties for truck overloadings. The maximum fine was computed by the county judge at the rate of 10 cents a pound for the overload. Fines from two to 10 cents a pound are provided for under the new law.

• **Emergency handbook**–The General Services Administration has put out the third edition of a handbook of emergency defense activities. The 125-page booklet lists names, addresses and telephone numbers of all federal agencies whose functions are devoted in whole or in part to the national defense program, including the newly-established Defense Materials Procurement Agency. Compiled by the

(*Continued on page 30*)

On bridges

DEARBORN NO-OX-ID
will stop rust before it starts

On bridges—viaducts—turntables, or other steel structures, one coating of NO-OX-ID is all that is necessary to provide complete protection against corrosion. Chemical and mechanical action of inhibitors in NO-OX-ID will stop corrosion wherever metal joins metal—or wood—or concrete. Extensive surface cleaning is unnecessary . . . easy-to-apply NO-OX-ID provides protection before, or after, corrosion attacks! A wide range of NO-OX-ID consistencies is available to meet *every* construction and maintenance requirement.

An experienced Dearborn Engineer will assist in selecting the correct NO-OX-ID formula to efficiently and economically stop rust on your next job.

DEABORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

MAIL THE COUPON FOR THIS BOOKLET
. . for complete introduction to the selection and uses of NO-OX-ID rust preventives.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza, Dept. ENR
Chicago 54, Illinois

☐ Gentlemen: Please send me a copy of "NO-OX-ID Rust Preventives."

☐ Have a Dearborn Engineer call.

Name.....

Company.....

Address.....

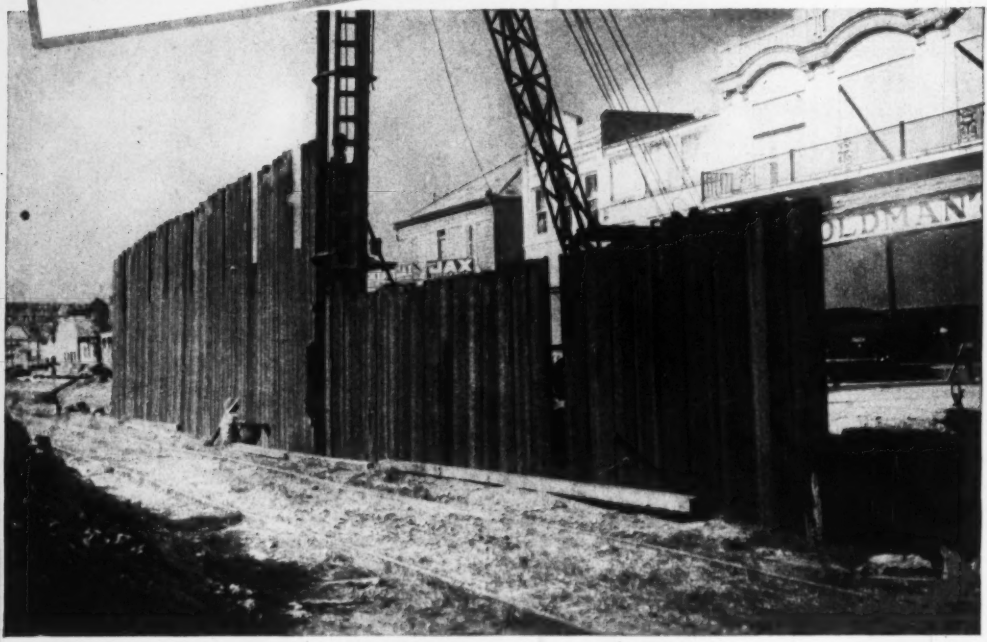
City.....*Zone*....*State*.....

Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + RUST

THE ORIGINAL RUST PREVENTIVE

McKIERNAN-TERRY PILE HAMMERS aid flood control



A McKiernan-Terry No. 7 Double-Acting Hammer drives piling north of the highway bridge on the Berwick side of the river.

No longer will flood crests sweep through the streets of Morgan City and Berwick, La. on opposite banks of the Atchafalaya River, because new reinforced-concrete walls, set on piles, are well above previous flood heights. To drive both the steel sheet and timber piling on this vital job, McKiernan-Terry Pile Hammers were chosen by Hendry Corp., the contractor.

On the Morgan City floodwall, a McKiernan-Terry No. 9 Double-Acting Hammer was used to drive 20 ft steel sheet piling and 35 ft timber piling on a batter into clay and silt. Steam was furnished by a portable boiler pulled along on skids.

A McKiernan-Terry No. 7 Double-Acting Hammer punched down steel sheet piling up to 35 feet in length for the 5,278-ft Berwick floodwall. Compressed air powered the hammer.

For flood control, bridge building, highway construction and many other types of construction, McKiernan-Terry Pile Hammers and Extractors are giving dependable, economical service. It's a profitable move to investigate this wide-range line.

Bulletin **tells everything you want to know about McKiernan-Terry's 16 sizes of single-acting and double-acting hammers and 2 sizes of double-acting extractors. Write for your copy today.**

McKIERNAN TERRY

McKIERNAN · TERRY CORPORATION · MANUFACTURING ENGINEERS · 13 PARK ROW, NEW YORK 38, N. Y.

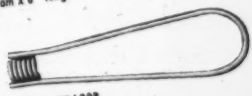
Plants: Harrison, New Jersey, and Dover, New Jersey

MK-307

HOLD EVERYTHING! YOU SURE CAN WITH TY-LOOPS CAST IN CONCRETE

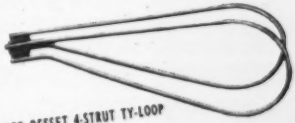
If you want rugged anchorage for forms, braces and brackets Richmond Ty-Loops are the answer. Available with 2 or 4 struts in a variety of types as shown—all with Richmond's electrically welded Tyscru principle. The heavier sizes, with safe load as an anchor up to 15 TONS, are extensively used for anchorage of cantilever forms in Dam Construction—eliminating the necessity for through ties or heavy diagonal ties.

HEAVY 2-STRUT TY-LOOP
½" Diam x 4" long
¾" Diam x 6" long



FLARED 2-STRUT TY-LOOP
½" Diam x 9" long
¾" Diam x 16" long

FLARED 4-STRUT TY-LOOP
1" Diam x 15" long



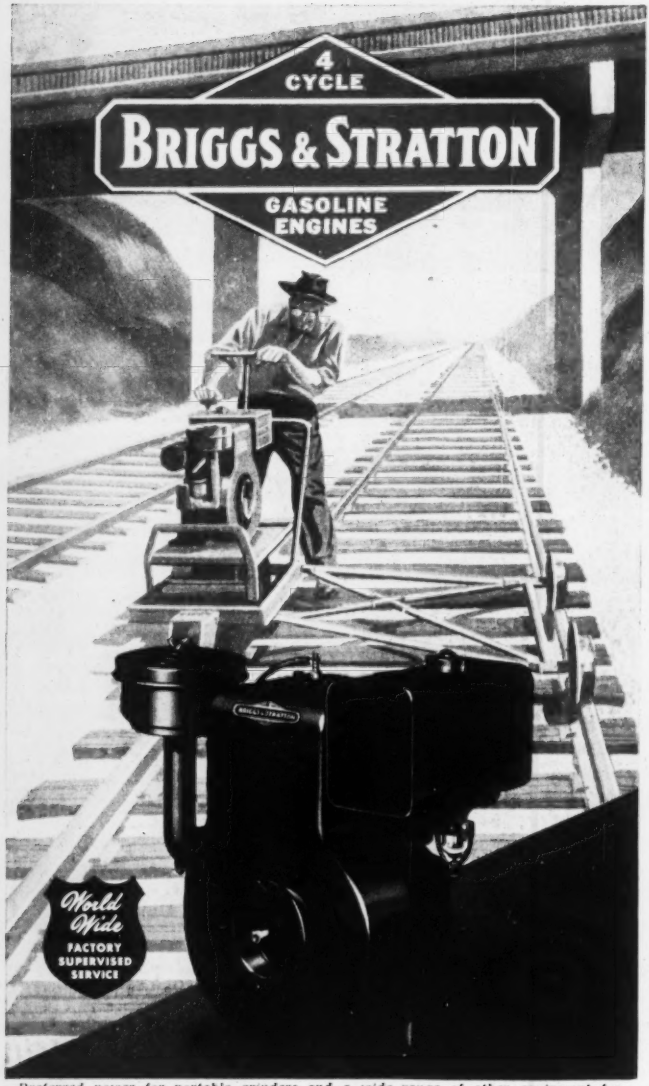
FLARED OFFSET 4-STRUT TY-LOOP
1" Diam x 18" long
1¼" Diam x 24"-36" long

Get your "SCREWY" or "TY" button—write Martin Boll at Richmond, 816 Liberty Ave., Brooklyn 8, N. Y.

INSIST ON RICHMOND
... AND BE SURE IT'S RICHMOND!

Richmond
SCREW ANCHOR CO., INC.
816-838 LIBERTY AVENUE · BROOKLYN 8, N. Y.

RICHMOND KNOW-HOW—DEPENDABILITY—SERVICE—ESTIMATES & JOB PLANNING



Preferred power for portable grinders and a wide range of other equipment for railroad maintenance — the world's most widely used single-cylinder gasoline engines on machines and tools for industry, construction, railroads, oil fields, etc., and on appliances and equipment for farm and home.

ONLY Briggs & Stratton can give you the benefits of more than 30 years of air-cooled power experience — gained in the production of more than 5,000,000 single-cylinder, 4-cycle, air-cooled gasoline engines.

Briggs & Stratton Corporation, Milwaukee 1, Wis., U.S.A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

News briefs . . .

federal register division of the GSA'S National Archives and Records Service, the handbook may be purchased for 30 cents from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

• **Safety award**—The Army Map Service has earned the National Safety Council's 1950 Award of Honor for Distinguished Service to Safety, Lieut. Gen. Lewis A. Pick, Chief of Engineers, has announced. The citation for the award, which is the National Safety council's highest honor, reads: "For an outstanding safety performance during the year 1950 which resulted in the greatest improvement in accident experience of all Engineer Corps installations and of all installations in the Military District of Washington. The Army Map Service reduced accidents by 33 percent in 1950 as compared with its 1948-1949 record. This was accomplished during a period when the demands for military maps of Korea raised production schedules.

• **Local contractors favored**—Aberdeen, Wash., has extended its business and occupation tax to include contractors from other cities doing work in Aberdeen. Any contractor moving equipment into the city is to be considered as setting up a business, and subject to the tax.

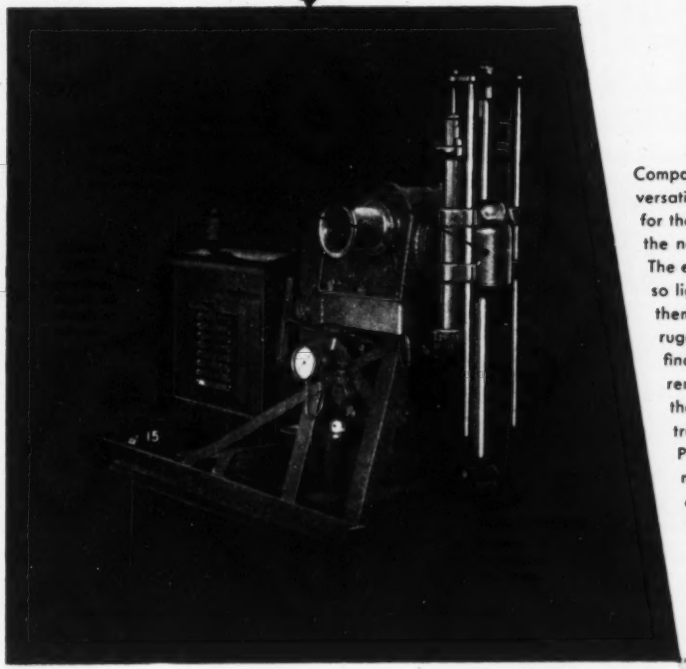
• **Special lane for trucks**—The first road to be built in Ohio with a special lane for trucks going up steep grades is a 3.3-mi stretch of State Route 14, between Twinsburg and Streetsboro. The new concrete and asphaltic concrete two-lane road has a third, black-topped lane, half a mile long, on one upgrade. That is for truckers to use. The new Route 14 section was a $386,229 job, to improve the route between Cleveland and Pittsburgh.

• **State aid for streets**—The North Carolina State Highway Commission recently mailed out checks totaling $4,543,096 to 386 municipalities eligible for state financial aid for their non-highway street work under terms of the Powell Act passed by the 1951 legislature. The funds came from a one-half cent share of the state's gasoline tax during the last fiscal year and were distributed on the basis of population and non-highway mileage within the municipality. The per capita rate figured about $1.50 per person, and the milage rate amounted to $435 per mile. Checks ranged from $251 for the village of Harrelsville to $235,235 for Charlotte.

MOUNT IT-POWER IT-USE IT

Anywhere!

THE NEW VERSATILE ACKER TEREDO CORE DRILL

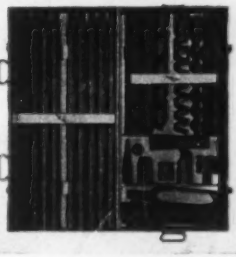


Compactness — dependability — versatility are a few of the reasons for the ever increasing popularity of the new Acker Teredo.

The essential parts of the Teredo are so light and compact you can carry them by plane or muleback — so rugged and dependable that you'll find Teredo's drilling in the most remote operations — so versatile that Teredo's are mounted on drags, trucks, jeeps, trailers and bulldozers. Power can be either, air or electric motor, gasoline, kerosene or diesel engine, or powered direct from jeep, truck or bulldozer.

Acker Soil Sampling Kit A portable kit containing all the necessary tools for accurately testing and recovery of samples of sub-soil conditions. →

Accessory Drill Equipment The Acker Drill Company carries a complete line of drill equipment, supplies and fittings. Write us about your problem.



OVER 30 YEARS EXPERIENCE IN THE MANUFACTURE AND DEVELOPMENT OF DRILLING EQUIPMENT

[redacted] **SCRANTON 3, PENNA.**

25 BRANCHES THROUGHOUT THE WORLD TO SERVE YOU

COMPARE...

Modine UNIT HEATERS HAVE EVERYTHING!

For heating at its best — have your representative show you a Modine Unit Heater installation. You'll notice the uniform comfort that's instantly available where and when it's needed. That's because discharge air temperature, volume and velocity are scientifically balanced.

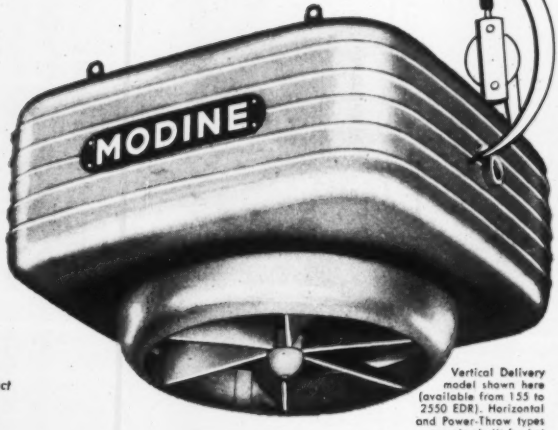
Check fuel and power costs . . . installation and maintenance expense. Without question, you'll find all are far lower than with other heating methods.

See for yourself. *Compare* . . . and you'll choose Modine. Modine Mfg. Co., 1565 DeKoven Ave., Racine, Wis.

Modine **UNIT HEATERS**

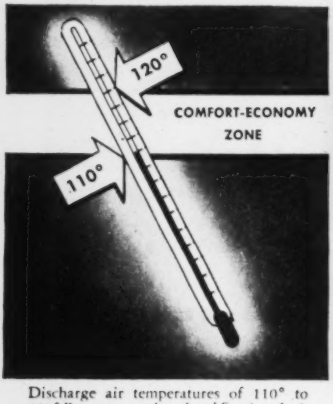
Write for Bulletin 149-A, "Modine Unit Heating." Or contact your Modine representative listed in the classified section of your phone book.

U-1118A

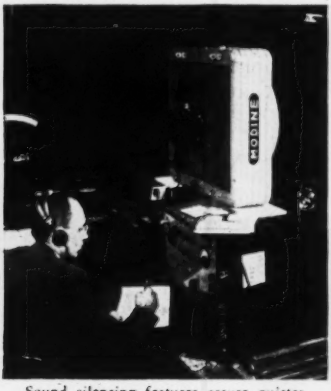


Vertical Delivery model shown here (available from 155 to 2550 EDR). Horizontal and Power-Throw types are also built for hot water and steam, as well as Gas-Fired units.

Three of many outstanding features that account for the Modine quality reputation



Discharge air temperatures of 110° to 120° F. are correctly related to air-velocities — assure perfect heating comfort plus lower fuel costs.



Sound-silencing features assure quieter operation—certified by accurate laboratory sound ratings. Especially important for commercial and institutional use.

Versatile control of air delivery is provided by Cone-Jet, Truncone or Louvre deflectors. You can choose the *right* one for your job at no extra cost.

IT ALWAYS PAYS TO SPECIFY

LADISH

Controlled Quality

PIPE FITTINGS

TO MARK PROGRESS

...you get full value for every fittings dollar

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF...ONE RESPONSIBILITY

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CUDAHY, WISCONSIN
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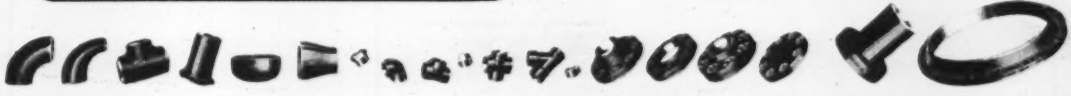
District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
St. Louis • Atlanta • Houston • Tulsa • Los Angeles • Havana • Toronto • Mexico City

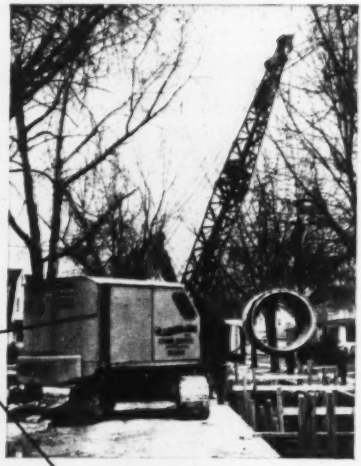
The more critically you appraise value... the more you will appreciate Ladish Controlled Quality Fittings. For the ultimate economy of Ladish Fittings is assured by laboratory, engineering and manufacturing controls unsurpassed for thoroughness and rigid standards. From metallurgy through machining ... repeated tests safeguard the extra strength and soundness vital to long dependable service ... extra value you can always depend on from Ladish Controlled Quality Fittings.

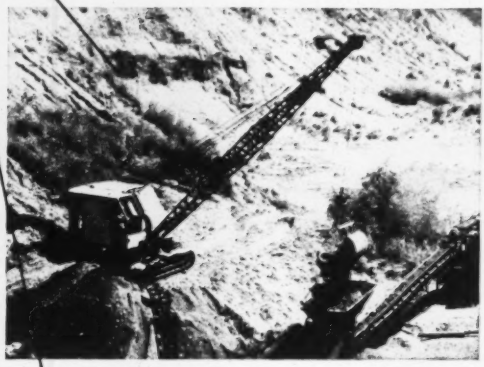


BAY CITY - the biggest value in ¾ yard machines .... easily convertible

Quick convertibility without machinery change is a feature that gives you more for your equipment dollar when you buy BAY CITY. Then too, you get ruggedness, dependability and long life that can't be matched.

Well balanced for Crane Work.
Stability for low boom operations.
Easy operation for hard digging.
High line speeds for faster material handling.
Power for fast digging cycle.

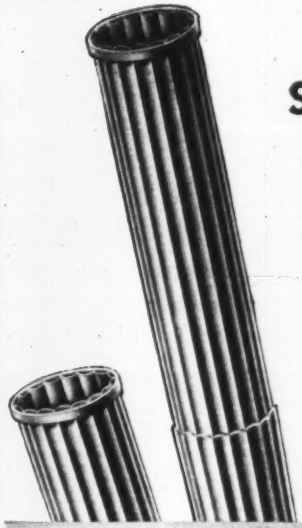




BAY CITY

BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

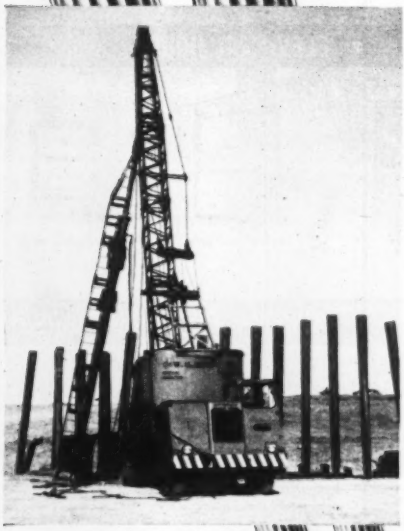


See how you save on foundation jobs

...with

MONOTUBE

TAPER-FLUTE STEEL PILES



Typical example of Monotubes being driven with a light truck crane in a hard-to-reach location.

CRITICAL MATERIALS SAVED! Because of Monotubes' proven excellence in transmitting loads to penetrated soil, plus assurance of their condition after installation, Monotubes can be designed for heavy loads. Result—fewer piles may do your job.

WORKING TIME SAVED! Monotubes are readily extendible on the job. Easy cut-off and simplified field weld-splicing when pile lengths vary. Cut-offs can be re-used.

FAST INSPECTION! Tubular design makes inspection before concreting rapid . . . easy . . . sure.

HANDLING TIME CUT! Monotubes' light weight makes handling and locating easier and faster. More piles can be driven per rig, per shift.

What's more, cold rolling of the steel to form Monotubes' flutes greatly increases the strength of the steel. And, besides increasing the surface area, these longitudinal flutes give the pile stiffness to permit driving without a mandrel. Another advantage—the joints between sections are fully welded to provide strength in all directions . . . so that assembled Monotubes are actually one integral unit for design considerations. Monotubes come in lengths, gauges, tapers and diameters to meet varying soil conditions. Write for information. See how they can make important savings on all types of foundation jobs. The Union Metal Manufacturing Co., Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles

"it's

PEELLE

engineered"

whether your project calls for equipment made to standard specifications, or for a special engineering approach and custom fabrication to rigid requirements, the Peelle-Richmond organization is equipped to serve you

Peelle-Richmond manufacturing covers a wide variety of doors for industrial and commercial buildings, as well as Peelle Motorstairs.

In addition, the Peelle-Richmond organization is exceptionally well qualified to do the basic engineering and custom building of such products as special purpose doors and motorized partitions and to handle, from start to finish, specification jobs that must meet unusual or exacting conditions.

Those planning the construction of defense plants will find the resourcefulness and long, varied experience of the Peelle-Richmond engineering staff very helpful in solving the type of problems encountered in such projects.

Please write for further information.

PEELLE - RICHMOND

The Richmond Fireproof Door Co.
The Peelle Company

PRINCIPAL SALES AND SERVICE OFFICES:

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PHILADELPHIA:
34 S. 17th ST. — PHILADELPHIA 3, PA.

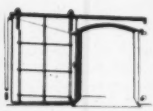
CHICAGO:
445 NORTH LASALLE ST. — CHICAGO 10, ILL.

SAN FRANCISCO:
26 STERLING ST. — SAN FRANCISCO 5, CAL.

OTHER OFFICES
IN PRINCIPAL CITIES OF U. S. AND CANADA

MAIN PLANTS: RICHMOND, IND. BROOKLYN, N. Y.

The Richmond Fireproof Door Co. — RICHMOND, INDIANA — DOORS FRAMES & HARDWARE

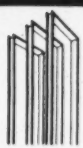


Underwriters' fire doors: metal clad, single-slide and double-slide

Underwriters' fire doors: metal clad, single-swing and double-swing

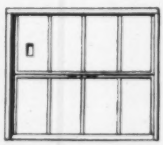
Kalamein doors: flush design or paneled, single or double-swing

Industrial steel doors: slide, single or double-swing



Welded steel frames and universal knockdown frames for fireproof doors; also frames of special widths and heights to order

The Peelle Company — BROOKLYN, NEW YORK — ELEVATOR DOORS



Freight elevator doors: motorized or manual

Motorized car gate

Dumbwaiter doors

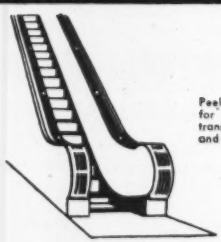
The Peelle Company — BROOKLYN, NEW YORK — SPECIAL PURPOSE DOORS

3 section vertical lift door, motorized, stainless steel and glass, 24 x 35 feet

10 section, horizontal slide, center parting hangar door

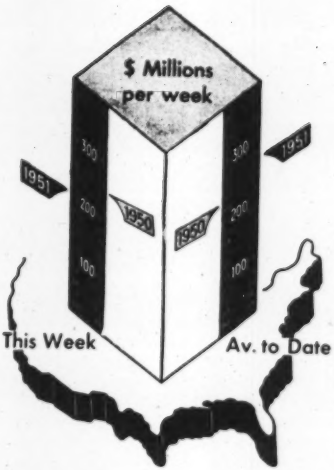
Horizontal slide, re-inforced concrete, soundproof door; 20' x 20', for engine test cell

The Peelle Company — BROOKLYN, NEW YORK — MOTORSTAIRS



Peelle Motorstairs 24", 32" & 48" for stores, banks, hotels, plants, transportation terminals, theatres and office buildings.

THE CONSTRUCTION WEEK



Contracts by type of work

	This Week	Cumulative 44 wks 1951	1950	% chge
Waterworks	$4.6	$178.4	$193.3	−8
Sewerage	3.9	273.5	246.5	+11
Bridges	3.1	278.2	324.2	−14
Highways	18.5	1,919.9	1,983.1	−6
Earthwork, Waterways	4.4	440.8	347.5	+27
Buildings:				
Public	28.5	1,881.7	1,428.8	+32
Housg., pub.	1.1	577.9	271.2	+113
Housg., priv.	50.2	1,676.4	2,817.3	−20
Commercial	9.9	541.9	844.3	−36
Industrial	76.2	3,635.0	1,395.3	+162
Unclassified	9.5	1,457.5	1,163.1	+25
Total	**$209.8**	**$11,961.2**	**$10,111.6**	**+18**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR COST INDEX

Index Base = 100		1913	1926	1949
Constr. Cost.	Nov. '51	546.57	262.74	114.58
Bldg. Cost	Nov. '51	403.91	218.34	114.81
Volume	Oct. '51	511	208	148

PRICE CONTROL DELAY—As this issue went to press, the Office of Price Stabilization had yet given no indication when its new regulation on construction prices (ENR Oct. 18, p. 23) will officially become effective. If the Nov. 1, marker is passed, OPS may raise its sights as far as Dec. 1.

ANOTHER SHORTAGE?—Another shortage—not particularly startling to builders—has been found by Defense Production officials lurking in the building scene. It is that of plumbing supplies, they say. Reported scarce are bathtubs and other fixtures that could curtail next year's home construction program.

THE DALLES—Now that Congress has appropriated $4 million to start the $350-million Dalles Dam in the Columbia River, U. S. Army Engineers are losing no time getting the project underway. First contracts will be awarded in March or April of next year, according to Col. Thomas H. Lipscomb of the Portland District. To be located at the head of the pool created by Bonneville Dam, 192 mi above the mouth of the Columbia near Dalles, Ore., it will be the second in order going upstream. Above it are McNary, Chief Joseph, both under construction and Grand Coulee, now in full operation. The structure will consist of a navigation lock, spillway, powerhouse, and non-overflow sections totaling 7,800 ft in length. Fourteen generators, each rated at 76,000 kw will be installed initially, of an ultimate 22 units. First power production is scheduled for 1957.

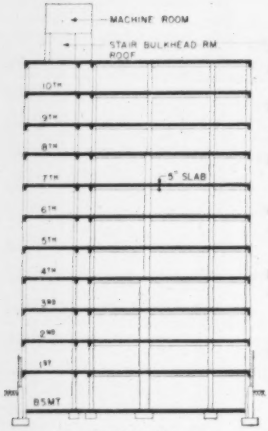
NEW TARGET IN OHIO—He started a drive which has some 30 Ohio cities busy on anti-pollution projects, now Attorney General C. William O'Neill has opened a new phase of operations. He has ordered an investigation of 75 cases of industrial pollution—backed up by the State's newly-strengthened "clear stream" law. Already he has obtained injunctions against three firms—Harveysburg Fertilizer Co., near Warren; Troy Sunshade Co., Troy; and E. Rauh & Sons Co., Silica. All accused will be given a chance to remedy conditions before court action is started, O'Neill states.

BRIDGE SITE CHOICE—Choice of a site for bridging Puget Sound west of Seattle appears to have narrowed to two. Charles E. Andrew, chief consulting engineer for the Washington Toll Bridge Authority predicts the route will be either from Seattle's Fauntleroy district to Vashon Island and thence to the Kitsap mainland south of Bremerton or from Alki Point in Seattle to Bainbridge Island and thence to the Kitsap mainland nearer Bremerton. Final decision is likely by Jan. 1. Traffic studies show a bridge across Puget Sound would draw enough revenue to support a bond issue of at least $85 million.

CANADIAN ALUMINUM—Work on the Aluminum Company of Canada's British Columbia project is proceeding at a fast clip. That's in spite of a recent report that the U.S. Joint Chiefs of Staff killed a proposed U.S. contract for B.C. Aluminum because the plant was too close to Russia. Still scheduled for first production in 1954, the $500-million construction job has no U.S. government money in it nor is it favored by U.S. guaranteed price agreements.

5 Key Advantages

EXPLAIN SWING TO REINFORCED-CONCRETE FRAME CONSTRUCTION



SECTION A-A

JOB DATA

Average Typical Floor

Superficial floor area
7,100 sq. ft.

Contact form area
11,000 sq. ft.
(1.55 sq. ft. per sq. ft. area)

Reinforcing steel
34,600 lb.
(4.9 lb. per sq. ft.)

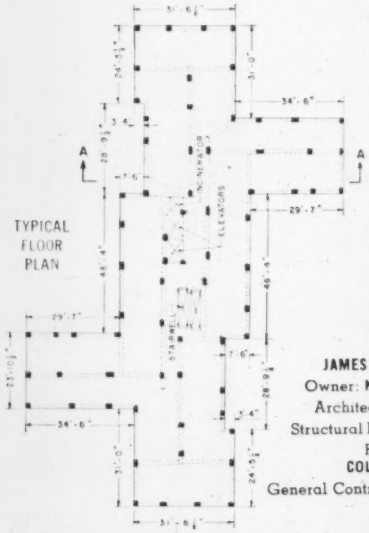
Concrete
160 cu. yd.
(averaging 7.3 in. thickness per sq. ft.)

Rub and patch area
6,900 sq. ft.

James A. Bland Houses—Concreted with 'Incor' 24-Hour Cement —Another Example of Progress in Design and Concreting Methods

● This New York City Housing Authority project in Flushing, N.Y., again demonstrates that multi-story concrete frames, with their inherent fire-safety, are being erected at less cost than traditional types, at equal or greater speed—with these results:

1. Typical column, beam and slab arrangement, with all beams over partitions, columns generally of same dimensions from floor to roof—saves on form-work and in placing reinforcing steel;
2. No beams in rooms—reduced story height without reducing cubage;
3. Reduced height of partitions and overall exterior masonry walls—shorter vertical utility runs;
4. Columns placed off line in either direction—greater freedom for architect;
5. Forming floor slabs with plywood—eliminates need for plastered ceilings.



An Assist from 'Incor' 24-Hour Cement

Designed for concrete, the Contractor lays out the job for assembly-line speed, making fullest use of dependable 'Incor' high early strength: Minimum heat protection in cold and cool weather; stripping schedules quickly regained after rain or other delay—maximum erection speed with minimum form investment. On James A. Bland Houses, CORBETTA CONSTRUCTION CO., INC., concreted 55 floors in 100 working days, with five form-sets—one set for each 10-story building.

Plan apartments, schools, hospitals, hotels, industrial buildings with 'Incor'* concrete frames, for fire-safety and stability, lower first-cost, less maintenance. *Reg. U. S. Pat. Off.

JAMES A. BLAND HOUSES, Flushing, N. Y.
Owner: NEW YORK CITY HOUSING AUTHORITY
Architects: CHAPMAN, EVANS & DELEHANTY
Structural Engineers: SEELYE, STEVENSON & VALUE
Ready-Mix 'Incor' Concrete:
COLONIAL SAND & STONE CO., INC.
General Contractor: CORBETTA CONSTRUCTION CO. INC.
all of New York City

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

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KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK
PHILADELPHIA • RICHMOND • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,000,000 SACKS ANNUAL CAPACITY

More help for roads

MORE GRASS-ROOTS HELP for hard-pressed state highway departments can be expected from a drive just launched by the General Motors Corporation through its dealers and field organization. The drive is to be started in every community where GM has any representatives, which is nearly every town or city of any size in this country.

This new campaign for rehabilitation and modernization of the nation's basic highway system is centered around a new GM motion picture "Let's Get Out of the Muddle" that is to be used to support local campaigns for better streets and highways. Like the newspaper advertising programs launched recently by the Goodyear Tire & Rubber Co. and the Firestone Tire & Rubber Co., it is designed to appeal to the local people for support of efforts to get local governing bodies to act.

As has been said in earlier comments on this subject in these pages, all hope of success in getting a more adequate highway system lies in getting local governing bodies to recognize that somehow they have got to find money to pay for the local share of any expanded road rehabilitation and road or street improvement program.

The GM campaign stresses the responsibility of each individual citizen. "Individual and organized groups cannot avoid responsibility by passing the buck to others." The program also emphasizes the fact that "modernizing our highways will cost money—lots of it." Those are the most important points. If they can be widely sold—and are widely accepted—a more adequate highway program is reasonably assured.

Post-college training

A CAREFULLY PREPARED PLAN for providing young engineers with more opportunities to continue their training during the years immediately following graduation from college was announced more than a year ago by the Engineers Council for Professional Development. It had been prepared by a group of men who were familiar with what had been accomplished along that line by some of the larger industrial companies. They had high hopes that the large employers of engineers would quickly provide the $100,000 that they estimated would be needed to carry the program for the first five years.

But a year has passed without any large contributions. The few pledges that have been received, plus contributions from the engineering societies, would not carry the project forward for one year under the plan as drawn up. Consequently, at the annual meeting of ECPD in Boston, some thought was given to starting the program on a smaller scale.

One proposal that was put forward warrants further study, as it might provide a better measure than we now have of the need for—or interest in—better facilities for post-college training among the men the program is designed to serve. Ralph L. Goetzenberger, vice president of the Minneapolis-Honeywell Regulator Co., suggested a direct appeal to the junior members of the societies sponsoring ECPD for money to start the training program.

Observing that junior members now make up nearly 50 percent of the membership of those societies, Mr. Goetzenberger said that the program could be financed easily by an increase of $1 in the annual dues of all junior members who favored the program, provided there is real enthusiasm for the proposal.

Under the proposed plan, many more evening courses in engineering subjects than are now available would be set up, especially in areas where such courses are not now available.

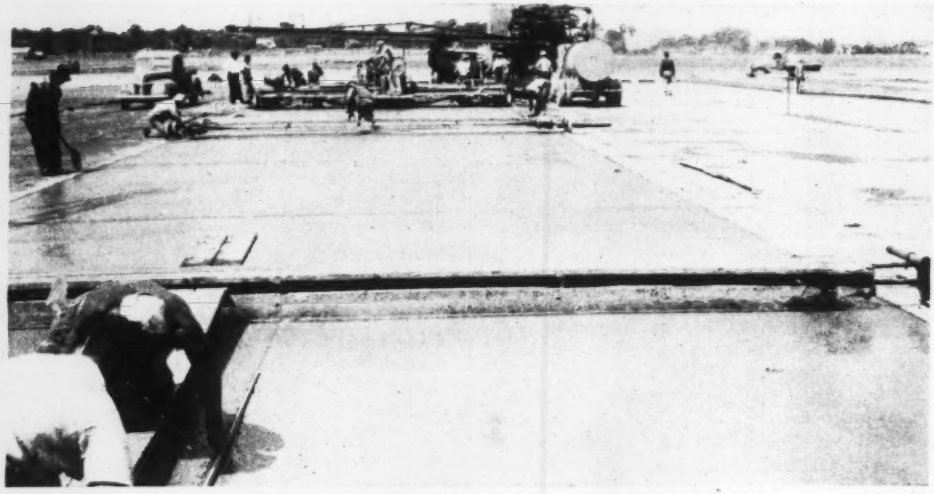
Most large industries that have such training programs in effect are enthusiastic about them. They make sizeable contributions to them each year in money or in employees' time, or both. But apparently those companies do not see why they should also contribute to programs for employees of other companies. Hence the ECPD program is without the support it had hoped to get.

What about the young men for whom the program was designed? Judging by the numbers seeking such additional training in the schools offering training courses for employed engineers and those taking the courses sponsored by industrial companies, there is need for more training courses. Yet until more is known about the extent of the need and where it is greatest, much time and energy could be wasted through organizing for more training in areas where there is little need for it.

A check of the junior members of the principal engineering societies would eliminate most of the present uncertainty. It need only be by a punch card that could be checked by machine to indicate how many men are interested, where they are located, what type of training is desired, and whether they are willing to pay a small annual fee to cover overhead costs.

Setting up post-college training of this kind for young engineers in the field of civil engineering will be more difficult than for other fields because so many of the young men in that field are widely scattered through many small offices and frequently are far removed from each other and from centers of population. That condition, however, should not be made an excuse for not including young civil engineers in such a survey. The survey might reveal conditions calling for special action by the American Society of Civil Engineers.

Here's photo proof that DURAPLASTIC* minimizes bleeding and segregation



● This picture of finishers working so closely behind the paver is clear evidence that Atlas Duraplastic air-entraining portland cement minimizes bleeding and segregation in concrete paving mixes.

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ENGINEERING NEWS-RECORD

NOVEMBER 1, 1951 VOL. 147 NO. 18

Free enterprise to keynote ASCE's centennial year

Annual meeting in New York hears president Carlton Proctor urge more private competition, less paternalism—Water policy, arctic, sewage financing feature sessions

New York—In a meeting that touched upon both current and long range problems, the 99th annual convention of the American Society of Civil Engineers furnished a full measure of challenges for the profession in the coming year.

The five-day annual meeting was the first held in New York under the recently adopted plan limiting society meetings to three instead of four each year.

The main challenge—preservation of free enterprise and self-reliance—was implicit in almost every session of the meeting. President Carlton Proctor keyed it in an address upon his formal accession as the ASCE's chief executive.

Noting the beginning of the society's centennial year, Proctor said all engineers are challenged to justify their pride in 100 years of engineered progress by assuming leadership in arresting the trend toward the "soul-destroying philosophy of maximum return for minimum effort."

On other major matters, the society:

• **Was told** that Engineers Joint Council has petitioned Congress to set up machinery to turn out a national water policy; was treated to an expose of areas of agreement and disagreement on such a national policy;

• **Heard** Lenox R. Lohr, president of the Centennial of Engineering, 1952, outline plans for next year's observance in Chicago, and cite the objective of the observance as one of convincing the man in the street—and particularly the nation's youth—that it is free enterprise technology that has given us "the highest standard of living the world has ever known." Said Lohr: "This can only be done by reaching the people through their emotions by a cafeteria of engineering knowledge, rather than a full meal of sleep-inducing statistics";

• **Heard** Mr. Proctor voice disappointment with a so-far unfruitful attempt (made at the invitation of the military a year ago) to improve cooperation between civilian engineers and the military services.

Proctor emphasized failures (1) To secure promises from the military not to waste already-too-small resources of technical manpower, (2) to stop the military from attempting to secure professional services in an unprofessional way: As though they were "bargain basement" items;

• **Was told** that the Board of Direction had authorized setting up a committee to correlate and digest information declassified by the Atomic Energy Commission, which may have particular importance and interest to the civil engineer and the architect.

• **Deeper meaning**—Hammering home the free enterprise theme, President Proctor told his audience that merely to point with pride to 100 years of accomplishment "will be unworthy of our heritage and of the genius of those who have made our profession great.

"There must be interwoven . . . the clear lesson that the success of past efforts would have been impossible, and the hope for continued progress and creative accomplishment will be unattainable if the operation of a competitive economy is choked off by the imposition of paternalistic state controls and restrictions of private enterprise.

"The politico-economic philosophy of something for nothing—that only a sucker works any harder than he has to—and that ideas are a natural resources is false and insidious.

"Because no group in our economy so completely refutes this philosophy daily work or attitude toward its job as do engineers, their centennial year keynote must be assumption of leadership in sound public thinking. Only in this way can engineers conserve the fruits of their labors and assure the continuance and growth of our modern civilization."

• **Urge water policy**—Self-reliance rather than paternalism, too, was the moving factor behind the EJC's action—reported to the Sanitary Engineering Division—of petitioning Congress to set up machinery to produce a national water policy.

What EJC has wanted—reflection of the views of a majority of engineers—is less over all direction from top U. S. levels, more work on the local and state levels toward direction of and utilization of the nation's water resources. Its latest action, according to W. W. Horner (St. Louis

(*Continued on page 44*)

TAKING OVER THE GAVEL, Carlton S. Proctor assumes ASCE presidency and receives the best wishes of retiring President Gail A. Hathaway during the installation ceremonies at the annual business meeting. In his keynote address Mr. Proctor said the engineering profession is in a unique position to combat the false idea of "Statism."

Structurals—

Can the steel industry make enough, or is more capacity needed?

The industry says:

We have enough now

Steelmen are certain there is no need at the present time for more capacity to make structurals. Their position is made obvious by the fact that if any steel company has drawn up plans to increase its capacity for structurals, it has kept them a closely guarded secret.

They base their position on their past experience in the structurals market. These experiences lead them to the conclusion that present demands are inflated, and controls on construction are going to cut down the demand in the future. They predict the supply of structurals will overtake demand within a year and no one will be too seriously hurt.

These views were ably presented last week by J. V. Honeycutt, assistant vice president, Bethlehem Steel Co., in a talk distributed by the American Institute of Steel Construction.

Inflated Demands

The Defense Production Administration report requests for structural steel shapes for the fourth quarter of this year totaled 223% of the supply, Mr. Honeycutt points out. Requests for the first quarter of 1952 are for 205% of the supply.

"It is the opinion of many of us that these stated requests are greatly inflated, are highly misleading and are far from being realistic," he says.

The demand for all end uses of heavy structurals for the fourth quarter is reported by the Defense Production Administration to be 2.9 million tons. This is equivalent to an annual rate of 11.6 million tons.

To this demand he contrasts shipments during the all-out war year of 1942 of 4,943,000 tons—the record year to date—and the expected peak in 1951 of 5.2 million tons.

"This reported demand for the fourth quarter of shapes for construction of more than twice the previous record quarter cannot represent a true picture when viewed in the light of known facts," he said.

Demand Dropping

"We know that the future work in our fabricating shops can be forecast by the volume of inquiries for bidding. This factor has been on a downward path since April," he said.

The backlog of the order book is decreasing. None of these facts supports a demand for shipment in the fourth quarter of more than twice the amount of structural shapes shipped in the second quarter of 1951, he said.

Mr. Honeycutt believes the demand for structural shapes will decrease further in the light of present controls on construction. To support this view he cites what happened in 1942 when the War Production Board placed restrictions on construction—shipments declined from 600,036 tons in the second quarter to a low of 143,866 tons in the first quarter of 1944.

This pattern of decline may well be repeated under the impact of the National Production Authority's controls on construction, he said.

(At a press conference last week, Bethlehem's President Eugene G. Grace even more optimistically predicted a decline in demand for structural steel within a few months. New structural steel business is not coming in as fast as the steel is being turned out, he said.)

Recommends Change

Mr. Honeycutt supports a steel industry recommendation that the DPA set up a competent staff to examine construction projects, and make realistic estimates of their requirements as to quantity and timing. Projects should get approval of this staff before allotments to them are considered.

Washington says:

We're not so sure

Mobilization boss Charles E. Wilson agrees with the position of the steel industry, or at least he has not insisted on any expansion in structural capacity.

But a number of government economists, including some of Wilson's aides, see the shortage of structurals as a brake on the defense effort now and on commercial construction in the future.

Under Wilson, the most this group has tried to do is pump the steel industry to get every last ton of structurals they can from existing capacity—and they have enjoyed some success. Heavy structurals production at 1,320,000 tons in the last quarter of this year, have been upped by the industry to an estimated 1,425,000 tons in the first quarter next year.

But their success has also been a source of argument. They say that until a few weeks ago, the steel industry saw no prospect of exceeding the 1,320,000-ton rate. With total steel production rising from 104 million ingot tons annually at the start of 1951 to nearly 119 million by the end of 1953, these bureaucrats think there would be an increase in structurals production somewhere along the line.

Concede Padding

Government controllers agree with the steel industry that so-called requirements reported to the Defense Production Administration are inflated. But they say that even when the inflation is removed, supply does not balance the demand.

They point out the widespread slowdown of highway construction, delays in construction of electric power plants, stoppage of school and hospital programs. Starts on project after project have been postponed.

Although the peak of mobilization demands for structurals—for new industrial plants, refineries, and other basic construction—will come in 1952, they foresee a rebound in commercial building.

Continued Demand

Postponement of commercial and civilian projects now is providing enough structurals to meet the mobilization peak, but after that there may be enough pent-up demand to keep structurals just as tight as they are now, controllers say.

Wilson himself figures that industrial expansion now in the works adds up to some $56 billions of new plant and equipment, much of which will be needing steel structurals in 1953 and later.

What's to Be Done?

In the National Production Authority, as also in the steel industry, it's wait and watch.

More efforts will be made to deflate demands for structurals and make them more realistic. The trend of supply and demand will be more carefully studied.

Predicts more steel use

The steel industry's conviction that demand for structurals is largely inflated and that it will soon be searching for buyers, is reflected in a talk last week by John D. Griffiths, district engineer for the American Institute of Steel Construction at the Institute's annual convention.

Mr. Griffiths predicts increasing use of structural steel to assure atomic bomb blast-resistant construction. Among ways building design will be changed he lists:

(1) More use of steel columns in place of masonry; (2) Use of more rigid connections in multi-story buildings, more welding; (3) More bracing and more frequent use of single-span rigid steel frames; (4) Use of blast walls around the core of multi-story structures.

Youngstown Sheet plans $40-million expansion

INDIANA HARBOR, IND.—Plans to build a new 56-inch cold strip mill and other facilities at its plant here were announced last week by Youngstown Sheet and Tube Co.

Already underway at the plant is an expansion program costing more than $100 million which will boost its iron and steel capacity. The new project will cost an additional $40 million, according to Frank Purnell, chairman of the board, and J. L. Mauthe, president.

Cold rolled sheet and strip capacity will be boosted by the newest phase, and will make it possible for later expansion of the plant's tin plate producing facilities.

"Going once, going twice . . ."

St. Paul, Minn.—Thirty-one contractors from Minnesota, Wisconsin and North Dakota pooled their heavy equipment recently for a co-operative auction to raise ready cash to meet running expenses and to pay off borrowed money.

The auction was held in St. Paul, Minnesota, where 21 shovels, 75 tractors, 65 power scrapers, 15 motor graders, 20 heavy trailers, 30 dump trucks, two asphalt plants, a stabilizing plant and a rock-crushing plant were among items that brought in a total of $1.4 million.

Some of the contractors were reported to be pulling out of the business—broken by the worst summer weather in 58 years. The area had almost continuous rains.

When contract climbs from $2.6 million to $12.3 million, Congressmen object

The U. S. Army's Corps of Engineers—and the U. S. Air Force—were smarting last week under the sharp criticism of a House subcommittee which scored the handling of estimates and contracts on the rehabilitation of Sampson Air Force Base, near Geneva, N. Y.

Crux of the criticism of the Army Engineers centers on the handling of a series of rehabilitation contracts under the stress of rapid change in overall plans for the Sampson base by the Air Force. Three separate contracts, involving four groups of contracts, were signed in seven months.

Total bills submitted to date—and there still remains an estimated $14 million of work on the huge former Naval Training Station—is more than $25 million. The naval base cost some $52 million when built during World War II.

The Air Force was rapped for accepting more recruits than it could handle, thus forcing rush work on the Sampson base to accommodate the new men.

• **The facts**—A check of the facts by ENGINEERING NEWS-RECORD revealed this involved sequence of events:

Army engineers, estimating probable cost of initial work at Sampson at $3 million, called for bids Dec. 21, 1950. Thirteen construction firms submitted bids.

Low bidder was a combine calling itself the Five Boro Malan Co., which submitted a bid of $2,677,676. Other bids ranged up over $4 million. The low bidder—awarded the contract on Dec. 28—was a combination of the Five Boro Construction Corp., which does rehabilitation work and some new construction (according to its officers), and the Malan Plumbing Co., Inc., both of New York City.

This combine began work at Sampson within a few days of the contract award.

• **Terminate contract**—However, as of midnight, Feb. 23, 1951, the Five Boro Malan contract was "terminated for the convenience of the government."

A new contract was then negotiated with a new combine, known as Sampson Air Force Base Constructors. This combine included the firms of Caldwell-Wingate, John A. Johnson, and Five Boro Construction Corp. The Malan company continued on the job as a subcontractor.

The new contract was negotiated on a cost-plus basis, and when completed in June of 1951, had cost the government $12.3 million.

• **And a new one**—In June, with the second contract nearing completion, the Army Engineers advertised for new bids on a second phase of the work at Sampson—this involving new work including barracks, administration building and the like as well as continuation of the rehabilitation work. The whole of the new job was now estimated at $18 million.

Two contracts on Phase II have been awarded, for a total of $6.6 million, both to Merrit-Chapman & Scott Corp., of New York City.

Further bids will be called soon for other facilities for an airfield at Sampson, including runways and taxiways, hangars, offices and the like.

• **Complications**—Further complications have been setting in right along, according to the investigation of the House subcommittee (of the House Armed Services Committee).

In May, Five Boro Malan submitted a termination claim for $6.3 million. The committee said this included a 15% profit of $825,000.

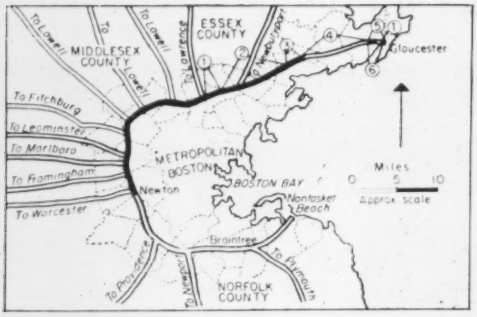
Charges of misuse of materials, excessive overtime costs (one contractor told ENR that he had seen pay vouchers for men who had apparently worked—and charged overtime for—three days without rest of any kind), excessive salaries to officials began to be aired.

One of the second group of contractors, in fact, told the House group that he had been assured by Army Engineers that he could count on getting the remainder of the work, after the cost-plus contract was completed. That assurance, he said, was rescinded by letter from engineer headquarters, saying that public interest indicated the advisability of advertising for competitive bids on the remaining rehabilitation and new work.

• **No sense**—The committee report noted that the Air Force decision to vastly increase the population of the base in a shorter time (the original contract called for 90 days), could be one reason for extravagance in the operation.

But it said that Corps of Engineers' explanations "simply did not make sense," and that it could get no satisfactory explanation of why the Corps ever went ahead with the original $2.6 million contract at all. "The conditions that led to the termination on Feb. 23 could have been foreseen on Jan. 1," the committee report said.

It added that many of the conditions criticized could be ascribed to "faulty planning of the job as a whole."



PROGRESS MADE—Sections 1, 2, 3, 5, 6, and 7 have been completed. Section 4 will soon be under construction. Section 7 is the new Piatt Andrew Bridge over the Annisquan River.

SPEED AND BEAUTY—Travelling through the outskirts of Boston, the highway avoids the bottlenecks of downtown traffic, and offers scenic interest as well. The entire route is landscaped.

New highway loosens Boston traffic

BOSTON—To Bostonians, their new circumferential highway sweeping around the city from Gloucester on the north to Nantasket beach on the south in a semi-circular arc, is looking more and more like a giant horseshoe.

Already the 22.5-mi section from Lynnfield to Wellesley, open to the public little more than a month, has registered an impressive flow of traffic.

Over its two 24-ft roadways, divided by a 20-ft median strip, have coursed an average of 23,500 vehicles per day. The most to travel on it in a single day totals 38,850 so far.

Week-end traffic runs particularly heavy. For example: Friday, Oct. 12—37,780; Saturday, Oct. 13—23,324; Sunday, Oct. 14—30,850.

• **More ahead**—The section just opened, with a total of 45 underpasses and overpasses criss-crossing scores of highway spokes into the hub of the city, cost nearly $18 million. Beautifully landscaped, it offers scenic attractions for the leisurely motorist. Busier drivers find its congestion-free routing a solution to some of the delays of Boston's maze of ancient meandering streets.

So well is it working, State Public Works Commissioner William F. Callahan expects to have under contract by the first of the year, remaining sections of the expressway (known as route 128) extending to Glouchester. Completion of the southern extension will follow.

Low bidder on the first two-mile section beyond North Beverly is Savin Construction Co. Contractors who have worked on the other nine sections are: A. V. Tarrasi; Lane Construction Corp.; Peter Salvucci; Gil Wyner; H. N. Worthington Co.; J. F. Fitzgerald Construction Co.; V. Barletta Co.

• **Artery underway**—Meanwhile work is in progress on Boston's new $30-million, 2-roadway, 10-lane expressway into the heart of the city, with completion scheduled for June 1953. Known as the Central Artery, it is the first highway built inside Boston by the Commonwealth of Massachusetts, Department of Public Works.

Mostly on one level, part of the Central Artery is a double decker, and one section is on three and four levels. The whole job will require some 20 contracts. Nine major contracts now in force represent half the total cost.

Engineers for the state are P. H. Kitfield, chief engineer; George H. Delamo, project engineer, Department of Public Works. Consultants are Charles A. Maguire and Associates; and Fay, Spofford and Thorndike, both of Boston.

Private power gaining in race with federal

The long-time trend toward more and more public power development appears to be wavering. The last session of Congress carefully sifted newly proposed projects for the Interior Department and the U. S. Army Corps of Engineers and pared down appropriations requested by both.

Important factor in this change of pace, however, is the continued new construction being undertaken by private utilities to power the huge U. S. industrial defense machine.

The Atomic Energy Commission, for example, is on the verge of completing negotiations with the South Carolina Gas & Electric Co. for a new 150,000 kw plant near the Savannah River H-bomb project. Indications are the plant will be steam driven.

Across the country last week, here are a few other expansion programs which made headlines:

• **Commonwealth Edison Co. of Chicago**—took steps to raise $250 million, the largest new financing program in the history of the utility, through a new stock offer. Funds will be used to carry out plant expansion. Construction plans for the years 1951 through 1954 call for expenditure of about $450 million.

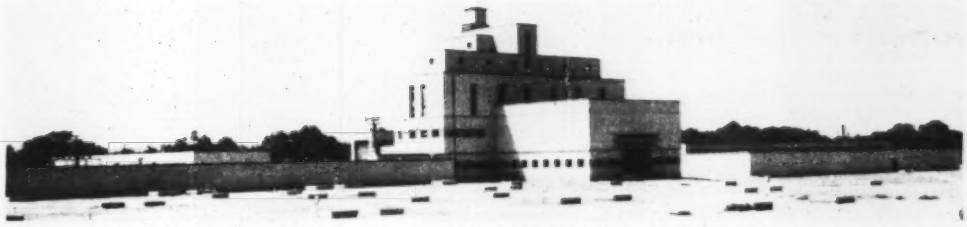
• **Ohio Power Co.**—estimated it will spend more than $119 million on new construction in the years 1951-53. Nearly one half of the total will be for new generating facilities including a $11.4-million addition at its plant near Parkersburg, W. Va., and $43.5 million for the Muskingum River station now under construction near Beverly, Ohio.

• **Consolidated Gas Electric Light & Power Co.**—announced plans to build a new generating plant in the industrial section of Baltimore, Md., with an initial capacity of 100,000 to 125,000 kw. The company's post-war construction will total more than $175 million by the end of 1953.

• **Central Hudson Gas & Electric Corp.**—announced it will build a new $11-million addition at its steam station near Newburgh, N. Y. bringing its total investment at that plant to $24 million, and raising capacity to 120,000 kw.

• **Portland General Electric Co.**—has had its application to construct and operate a power project on the Deschutes River in Jefferson County, Oregon, recommended for a federal license by a Federal Power Commission examiner. The project includes a 205-ft high concrete arch dam, reservoir, and downstream powerhouse containing three 36,000-kw generators and other facilities.

• **Virginia Electric and Power Co.**—faced another Interior Department move to block its court-upheld construction of the $27-million Roanoke Rapids project. The Virginia REA asked the court for a rehearing.



GLEAMING NEW—The newly completed filtration plant on East Side, known as the Nottingham plant, took nearly four years to build. Of ultra-modern design throughout, the plant's facilities can process 100 mgd for county-wide distribution.

Cleveland drinks Lake Erie's waters through new $21-million system

Cleveland has put a giant drinking straw out into Lake Erie.

It is a tunnel 10 ft in diameter which runs nearly 3¼ miles under water and another 1½ miles underground to a $21-million filtration plant on the city's East Side which has just gone into operation.

Through this tunnel, Cleveland is now drawing 100 mgd. When needed, it can draw another 50 mgd.

The new plant has been under construction since Dec. 1947. Already Cleveland has plans for construction of another to be located on the West Side. To be built in stages, the first installation is expected to cost about $15 million and will add another 50 mgd to a water supply capacity that is now up to 400 mgd.

• **Made pure**—The new East Side plant tunnel draws water from an intake crib 40 ft below the lake's surface into a subterranean screen well. From the well, it is pumped to the chemical building where it is treated with alum or iron, lime, activated carbon, and chlorine.

Next the water goes to flocculation basins where the mixture coagulates for 45 minutes. Then it flows through settling basins at less than 1 fpm in about 3¼ hours.

Filter beds consist of 39 in. of sand and gravel in graduated layers. There are 24 filter units, each containing 1,450 sq ft, which filter an average of 2 gpm per sq ft. Built into the administration building is a 300,000-gal wash water tank.

• **Distributed**—The filtered water feeds to a 25 mg clear well and from this well it is pumped into the county-wide distribution system.

Planning and construction of the new plant was under supervision of Emil J. Crown, Cleveland director of public utilities. Consulting engineers were Havens & Emerson; consulting architects were Small-Smith, and Reeb.

Hunkin-Conkey Construction Co., Cleveland, were general contractors. The intake tube's water section was done by Merritt-Chapman & Scott, while the land section was constructed by Kalill Co. Electrical contractors were Dingle-Clark Co., Hatfield Electric Co., and Harrington Electric Co.

• **One man job**—All the plant's mechanical equipment is electrically operated. The operating heart is the pumphouse. The main control room is equipped with electric push button panels where one operator has complete finger tip control of the plant's operation.

$23-million causeway to cross Canso

NOVA SCOTIA—Canadian engineers will face a tricky problem in spanning the treacherous Straits of Canso.

Announcement that a $23-million causeway will be built instead of a bridge as originally planned (ENR, April 17, 1949, p. 17), was made at the opening session of Canada's Parliament. At the same time an official statement has been issued in Ottawa saying that work will start almost immediately.

The Straits of Canso separate the mainland of Nova Scotia from Cape Breton Island. The causeway will ease and speed products from the coal mines and steel works located on the island's northern coast.

• **Only link**—Now the only link between this vital industrial center and Canada is a ferry service. But the train ferry, operated by the Canadian National Railways, is a slow and expensive proposition.

Adoption of the causeway eliminates plans for a $13.5-million bridge assured two years ago. Decision to build the bridge followed a report by a three-man board of engineers and ruled out the possibility of a causeway. But much argument arose over the design of the bridge and it was finally abandoned.

The biggest problem of the causeway engineers will be to conquer the swift tidal currents of the narrow straits. Another handicap will be water depths of over 200 ft.

• **Large fill**—The causeway will follow the same route as the proposed bridge. It will contain 4.5 million cu yds of rock and must include a ship lock crossed by movable rail and highway bridges. Preliminary plans call for the top of the causeway to be 20 ft above high tide and 80 ft wide. It will have a 24 ft roadway, a single railroad track and a six ft sidewalk.

Opening bids for the causeway will be called for in 1952, and bids on the ship lock construction the following year. O. J. McCulloch and Co. has been appointed consulting engineer for the project.

Canadian National Railways, who will operate the railroad across the new span, have expressed full approval of the causeway project along with the provincial government of Nova Scotia.

ASCE sessions brisk

Water policy and sewage financing turnpikes and arctic construction

(Continued from page 39)

consultant who steered EJC's volunteer study of water resources) is a part of an effort to modify, then capitalize on recommendations of the President's Water Resources Policy Commission.

Mr. Horner's presentation of EJC's viewpoint on water policy followed a talk by Samuel B. Morris, general manager of the Los Angeles Department of Water and Power, who served on the Presidential commission. Ably and patiently, Mr. Morris again set forth major recommendations of the commission report; Mr. Horner stated EJC's objections—claiming they far outweighed the points of agreement.

In a discussion following the formal talks, Morris pointed out that the bulky three-volume report to the President was hastily done (especially Volume I—A Water Policy for the American People). Legislation drawn up since by the commission "still in the Administration's hands and not yet made public" was more carefully prepared, after a more complete study of EJC's and other recommendations. "It will be seen when the legislation is finally brought out," said Morris, "that there exist fewer disagreements than now supposed with EJC's principles of a sound water policy."

(In a later interview with ENR, Morris again stressed the importance of the many points of policy on which there is general agreement among engineers. He emphasized that even now millions of dollars worth of water use construction has been authorized—some of which could not be justified by the principles on which the President's commission and EJC's are in complete accord.)

• **Financing Do your own**—Audience and panel members discussing financing of sewage works wound up with at least one point of general agreement:

They disapproved federal aid for municipal sewage works.

The panel (Cleary, Friel, Greeley, Niles, Schroepfer and Steinmetz) held that there was no one "preferred" way to finance municipal sewage. But in discussion they concurred that fundamentals set forth in recently published reports on water and sewage rate structures (ENR Oct. 18, p. 29) should prevail.

An answer to Moderator Cleary's question as to what yardstick should measure a community's ability to pay for sewage works came from the floor. C. A. Emerson put it this way: "The real criterion is the ability of the community to pay, in the opinion of the bankers . . . The question is simply—how much can you raise taxes?"

• **New Jersey Turnpike**—New Jersey's 118-mile toll turnpike (part of which is to be opened to traffic within a few days) was discussed in detail at sessions extending over part of two days, and ending with an inspection trip over the northern end, where costs run to $8 million a mile.

Discussing that unprecedented highway construction were: Paul L. Troast, New Jersey contractor who heads the Turnpike Authority; Charles M. Noble, chief engineer; George W. Burpee of Coverdale and Colpitts, consultants who made traffic studies; and Enoch R. Needles, head of the consulting group employed to design and supervise construction of the project.

Mr Needles departed from the prepared text of his address to observe how unusual it was for consulting engineers to find themselves working for a contractor. He added that "had it not been for the able direction of a man familiar with construction, supported by two other experienced businessmen (who make up the authority) the project could not have been carried to successful completion in so short a time."

W. W. Wanamaker, executive director of the Turnpike Authority, summed up the undertaking in what he characterized as a "deviation from formality" by describing the authority function as:

"To speed up progress; obtain perfect construction methods and procedures; procure the . . . best contractors at prices below engineers' estimates; issue only such change orders or modifications as would reduce the costs and improve quality; and, finally, lay down an asphaltic concrete pavement and convince the Portland cement people that it was a good decision."

• **Turnpike bridges**—The northern portion of the turnpike passes through densely developed residential and industrial sections and crosses the Passaic and Hackensack rivers. Within a 14-mile stretch from the Rahway River to the northern bank of the Hackensack, there are about 45 bridges and viaducts. . . . Having a total length of five miles, these structures cost $45 million to build. The two largest were described by O. H. Ammann, of Ammann and Whitney, consulting engineers on the Passaic crossing, and Ellis E. Paul, of Howard, Needles, Tammen and Bergendoff, consulting engineers on the Hackensack bridge.

Both of these bridges set a new plate-girder span record for the U. S. Amman, of Amman and Whitney, —375 ft.

The world's longest girder span is a 643 ft hollow box member in the Bonn-Beuel bridge over the Rhine in Germany, built in 1949.

Mr. Ammann said that preliminary plans have been made for future extension of the New Jersey Turnpike across Newark Bay to Jersey City that will incorporate a 440-ft plate-girder span. This, he considers, is the practicable limit for the single-web girder design. Total length of the Passaic River bridge is 6,955 ft and of the Hackensack crossing 5,623 ft. construction costs are $13.1 million ($22.92 per sq ft of deck area) and $9.5 million ($19.55 per sq ft of deck area) respectively.

The greater unit cost of the Passaic viaduct is attributed to less favorable alignment, severe foundation conditions, and greater interference with construction from railroads and utilities. Both bridges are expected to be opened to traffic by December, only two years after the start of final planning.

Details of the design and erection of these structures will be published in ENR in the near future.

• **Radiation shields**—Shielding against nuclear radiation from radioisotopes was discussed by H. M. Glen, supervising structural design engineer, Oak Ridge National Laboratory. The problem is largely that of limiting gamma radiation to a level the human body can tolerate. If gamma rays cannot penetrate a barrier, chances are that alpha and beta particles will not get through. (Design data for neutrons are still considered classified information.)

Shielding elements of high atomic weight are best. Lead is probably best, but for structural reasons, concrete and steel are often used. High density concrete (sometimes above 200 lb per cu ft) is preferred and is obtained by using barytes or steel pellets as aggregates.

Viewing windows are usually filled with zinc-bromide solution, equivalent to concrete in shielding properties. Access doors are made of lead in a steel frame or of sheet steel with lead affixed to one side. Frames for these doors and for the viewing windows in concrete barriers are sometimes filled with poured lead or lead shot to prevent leakage of radiation through openings.

AWARDING THE NORMAN MEDAL to D. B. Steinman, consulting engineer. Waldo G. Bowman, editor, Engineering News-Record (left) reads the citation during the presentation held at the ASCE's 99th annual business meeting. Mr. Steinman received the ASCE's highest award for his paper on "Aerodynamic Theory of Bridge Oscillation."

• **Power tight**—There was no debate as to the fact that the nation is now operating on a close margin of reserve power, although there was difference of opinion as to whether the current shortage of hydro power in the Southeast and Northwest is as serious as it is claimed.

R. Frank Brower, consultant to the Defense Electric Power Administration, told the Power Division:

At the start of World War II the nation had a reserve supply of around 23 percent. That had been cut to 12 percent by the end of 1949. At that time the electric utilities planned to add 17 million kilowatts in the three year period 1950-52. Due to the great increase in demand, that has been stepped up to 27 million for the years 1951-53.

• **Delays cited**—At the present time, Mr. Brower said, one and a quarter million kilowatts in new capacity is being held up by delays in getting steel and copper. As a result, the power situation is more serious now than at any time during World War II, although it will not become apparent to the public until late in 1952.

Power already is in short supply in the Southeast and Northwest, where lack of normal rains has cut output of hydro plants on which the region depends.

On this point, Howard L. Melvin, Ebasco Services, New York, who has just returned from the Northwest, said that the average water supply over the next few months will enable the utilities to carry the load. He thought that the Bonneville Power Administration had cut aluminum production prematurely.

John C. Stevens, consultant of Portland, Ore., supported this view. Most of the much publicized water shortage, he said, is political.

• **Arctic construction**—Responding to the increasing importance of "the top of the world," the Hydraulics Division devoted four of its five sessions to activities of its joint committee on snow, ice and permafrost.

Major investigators and pioneers in Arctic matters contributed. They included: Col. Bernt Balchen, USAF; John Holmes of the Oceanographic Laboratories, Woods Hole, Mass.; Robert E. Frost, Purdue University research engineer; Henry J. Manger, St. Paul District, Corps of Engineers, who has handled permafrost study projects since 1945; A. F. Ghiglione, commissioner of roads, Alaska, and others.

Their conclusions:

1. In a few years commercial airlines will be following great-circle routes that will take them over frigid areas. They will need special navigational equipment (already in existence) and emergency landing fields along the routes.

2. Generally, such emergency fields must be on earth—not on ice caps or fields. Study of ground conditions, therefore, is imperative.

3. In a pinch however, a number of ice surfaces—lakes and lagoons, rivers, heavy ice floes, ice caps, in that order—may be used. Studies have been made of the possibilities of landing on ice, much more study is needed.

4. For safety in making such landings, a key should be developed for use of airmen in determining the relative safety of the emergency landing areas. Such a key could be developed, but its use should involve the use of a trained engineer who could combine visual data with climatology and other data.

5. Factors including soil mechanics characteristics will have to be obtained on the ground, and much work remains to be done in relating experimental to actual conditions.

Although construction for air transport received a substantial amount of attention, the problem of arctic highways was also covered.

• **Describes fence**—Mr. Ghiglione discussed icing problems:

A device for preventing road icing is the "ice fence"—made of mesh or slats covered with tar paper. These fences up slope from the road, divert the water, making it freeze off the roadway. When one fence is ice covered, another can be constructed on top of it.

To cope with stream icing, high, clear bridge spans are preferred. Where the supports must be in the stream, steel pilebents are preferred, left unbraced to minimize ice loads during thaw. The thermal conductivity of the steel tends to hasten thawing at break-up time. Also, H-pile bents are preferable because they can be built in winter when most bridge work is done.

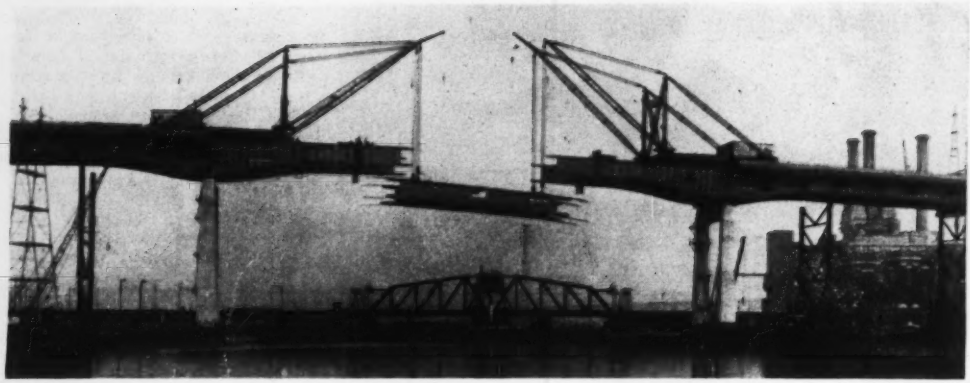
• **Concrete design**—New formulas for reinforced concrete are a possibility, said R. F. Blanks, vice president and general manager of Great Western Aggregates, Inc., Denver, who credited the Reinforced Concrete Research Council—a contracting agency for the Engineering Foundation—with stimulating research in this field.

Created in 1948 to put design on a more scientific basis, the organization is sponsored by the ASCE and the American Concrete Institute. Projects it has under way include: behavior of eccentrically loaded columns; rigid-frame design and shear and diagonal torsion in beams. Its most recent undertaking is determination of the distribution of compressive stresses in beams, especially near ultimate loads.

Some results of the column project were presented by Evind Hognestad, research assistant professor, University of Illinois, Urbana. To predict the behavior of eccentrically loaded columns, at all stages of loading, Professor Hognestad developed a new theory. He assumed a parabolic stress-strain relationship for the concrete up to 85 percent of the cylinder strength, beyond that a straight line.

He placed a limit of 0.0038 on the unit strain and assumed that the

(*Continued on page 46*)



LONGEST IN U. S.—With the erection of 115-ft long closing sections, Bethlehem Steel Co. completed the longest girder span in the U. S. It is 375 ft long, part of a 275-375-275-ft continuous girder, with 31-ft cantilevers at both ends. Designed by Ammann & Whitney, the bridge will carry six lanes of New Jersey Turnpike traffic over the Passaic River at Newark. In the long span, there are two girders, built of silicon steel, about 14 ft deep at midspan, 24 ft over the supports. The world's largest girder span is 634 ft long—a box member on the Rhine at Bonn, Germany.

ASCE:

Rainmaking, airfields, traffic

(*Continued from page 45*)

concrete takes no tension and that plane sections remain plane during bending. Tests result appeared to confirm these assumptions. (Complete details will be given in a bulletin soon to be published by the university. This research may be made the basis for new design formulas for members subjected to combined axial and bending stresses.

• **Science and theory**—One of the features of the meeting was the inaugural session of the Engineering Mechanics Div., created to meet the need of specialists in the highly scientific fields of the profession.

The papers met this test. Kenneth E. Sorenson, of the Harza Engineering Co., Chicago, showed how to solve the differential equations for discharge from a reservoir by a simple graphical method. Prof. Mario G. Salvadori, Columbia University, indicated how earthquake stresses in a multistory building could be computed by numerical integration.

Profs. S. J. Erickel and L. E. Grinter, Illinois Institute of Technology, presented a procedure for estimating the effects of atom blasts on bridges.

• **Miscellany**—Among the many other papers on the five day program several brought out ideas worth special note:

Artificial rainmaking would not be expensive for New York City, said Meteorologist Wallace E. Howell, who reported that his efforts last year brought a 17 percent increase in rainfall over the area seeded, coupled with a 39 percent stimulation of the storms that were seeded. Benefits to expense are in the ratio of 100 to 1.

A rapid transit rail system, publicly owned and unified, in the New York metropolitan area, is the only answer to mass transportation problem. Express highways merely worsen the traffic bottleneck, claimed William Reid, president Hudson and Manhattan Railroad Co.

Effective zoning around airports can only be guided by a map with the following features, said B. F. Beavin, consulting engineer of Baltimore: (1) Reference point and runway ends fixed by state coordinates; (2) Horizontal limits of imaginary surfaces fixed by radial distance from the reference point; (3) Runway end elevations and a minimum number of imaginary surfaces referred to mean sea level; (4) Ground contours and landmarks shown in dashed lines.

Airfield underdrainage installed by dragging a plud through the earth—and fittingly named "mole" drainage—is being tried by the Corps of Engineers. Howard E. Williams of the Washington office and James Haley of the New England Division described how the force for dragging the plug is transmitted from a tractor by means of a vertical knife (earth cutter) to the lower end of which the plug is attached. Water seeps into the channel (formed in the earth by the plug) through the slot made by the towed knife.

New Jersey Turnpike speeds to completion

TRENTON—Within the next two weeks you'll be able to drive from Newark, N. J. to the Delaware Memorial Bridge in two hours.

Tape will be cut on the southern 53 miles of the New Jersey Turnpike this week. In two more weeks another 56 miles will be ready—opening to traffic 109 miles of toll expressway from the Deepwater terminal at Delaware Memorial Bridge to Raymond Blvd. below Newark.

Within ninety days after that, the final nine miles from Newark to a connection with the George Washington Bridge over the Hudson River, delayed by a shortage of steel for two long bridges, will be completed.

• **Sets record**—In the annals of highway construction, the New Jersey Turnpike is writing a new chapter for speed and coordination.

First contracts were let in January 1950. The first 109 miles will be complete in less than 22 months after the project started, and the entire project finished within two years—the largest job ever completed in so short a time. (ENR Aug. 23, p. 29.)

• **ASCE trip**—Members of the American Society of Civil Engineers attending the society's annual meeting in New York inspected the northern sections of the turnpike on Oct. 26.

Those sections include the Passaic River crossing, shown above, and the Hackensack River crossing, a similar high-level viaduct designed by Howard Needles, Tammen & Bergendoff and being built by the American Bridge Co. The main span of the bridge will be completed in a few days.

At AASHO convention:

Highway officials seek more steel, urge public support for road programs

OMAHA—Two major issues dominated the 37th annual meeting of the American Association of State Highway Officials held here last week.

They were: (1) Procurement of enough steel for construction and reconstruction of highways vital to both the national economy and the defense program; (2) Mustering public support for acutely needed financial programs which will assure sound development of a safe highway system.

These two issues were first pointed up by J. A. Anderson, chairman of the Virginia State Highway Department, and president of AASHO, at the opening session. Other prominent speakers at the four day meeting added emphasis to the situation.

• **No letdown**—While we will be short of steel and other construction materials for many months, declared Mr. Anderson, keeping our highway systems in order is absolutely essential. They are vital to the safety and economy of our nation.

"Our leaders in the highway field are determined that the essential role of highway transportation shall not be cast aside. When materials and equipment are sorely needed, we will not take no for an answer," he said.

• **Better public relations**—Now, more than ever before, we must have the best in public relations. Our highway people must know the what and why of their work, and they must give the public a full understanding of their problems, he said.

One of the biggest problems facing highway departments is how to attract and hold talented young men and women to cope with the complex problems of road building, reconstruction and maintenance. Their worth to the department should be periodically evaluated and rewarded.

"The problem of toll roads is upon us. It cannot be ignored or brushed lightly aside. I, personally," said Anderson, "cannot visualize a national system of toll roads competing with our network of free highways. It is difficult to conceive that both can long survive in competition. One must perish, and I believe that history will confirm this opinion."

• **Delayed projects**—The seriousness of the steel situation was discussed by Thomas H. MacDonald, Commissioner, Bureau of Public Roads.

The number of highway projects under construction but delayed by the failure of steel deliveries has grown from 319 on Aug. 15 to 680 on Oct. 5, at which time the steel shortage totaled 122,500 tons. It represents a total cost of construction, when completed of $305,860,000.

"The failure to complete these projects will reduce the federal highway expenditures within this calendar year. But," warned Mr. MacDonald, it will necessitate higher maintenance costs on the part of the states and the local government units. The direct loss to the public purse of delayed or deferred reconstruction of highway projects is inevitable: without considering the waste of time and loss of productive capacity.

B. D. TALLAMY—Superintendent, Department of Public Works, New York, was elected president of the association, succeeding J. A. Anderson, chairman of the Virginia State Highway Commission.

• **Deficiency critical**—For the past ten years, Mr. MacDonald said, the rate of rehabilitation of our highway plant has averaged far less than the annual rate required to keep it even in reasonably adequate condition. The accumulated deficiency now stands at 74,000 miles, and is increasing by 5,000 to 6,000 miles per year, he said.

This estimate does not take into account the large amount of obsolescence due to the unprecedented increase in traffic. Neither does it show the more rapid deterioration of highways under a larger volume of heavier loads, nor the cases where traffic flow exceed traffic capacity. If we add to the above figures the road mileage that is deficient in width, curvature, and grade, it will be about three times as large, concluded Mr. MacDonald.

• **More steel**—Some hope for a brighter picture of the steel situation in highway construction was offered by D. C. Rentzel, undersecretary of Commerce for Transportation.

He assured the convention that defense authorities in Washington, D. C. recognized the vital role highway transportation is playing in our economy. But he warned that the painful pinch in steel and other critical roadbuilding materials will come to the fore in the first six months of 1952.

• **Truckers view**—Milton Kramer, assistant to the president, Associated Transport, Inc. told one of the numerous committee meetings "there are too many unnecessary misunderstandings between officials and operators of trucking companies, and highway engineers. Both groups are concerned in conserving our highways."

"The trucking industry realizes that highways are the life blood of its existence and it is launching a program of better cooperation in their use, as well as promotion of more and better highways," he said.

Although not at liberty to give details, Kramer said his company—the largest trucking concern in the country—has developed vehicles that will carry better distributed loads. This should set a pattern, he said for other trucking companies to follow, since it makes possible more economical truck transportation with less strain on the highways, he said.

• **Awards made**—Registration at the four-day meeting totaled 875. Merit awards in recognition of 25 years service, were presented to 186 highway engineers, bringing the total awarded to date by the association up to 1,720. Members of the Bureau of Public Roads led the list receiving 27 awards, followed by the Tennessee State Highway Department with 22.

Builders face dilemma in U. S. defense areas

Authorizing an area for defense housing looked at first glance like a blessing to the private builder, but for many it's turned into a headache.

While government gives them the nod to mass build dwelling units on the one hand, it also establishes a ceiling price on cost and rental rates for the completed houses. These ceilings are so low many builders claim they would lose money.

Hoping to find a solution to some of their problems 12 of the nation's leading low-priced home builders got together recently in Midwest City, Okla., to swap ideas that will cut building costs. They have labeled their project "Operation Trade Secret."

Southwestern pipeliners invade Northeast

THESE DAYS the ether in New York and New England crackles with southwestern accents, as fast-moving crews push big-inch pipes farther and farther from the oil fields where the pipeliners grew up.

Mechanized to the utmost and coordinated by two-way radio, the crews at present are working hardest on bringing natural gas to New England. But there are petroleum lines, too.

A year ago a new 236-mile 18-in crude line was laid between South Portland Me., and Montreal East Quebec, to parallel an older 12-in. line. The U. S. section of this system is owned and operated by Portland Pipe Line Corp., and the Canadian section by Montreal Pipe Line Co. Ltd. Now the Army is connecting Scarsport and Limestone, Maine (Air Force Base) with a products line, and there is a talk of a Navy line between Portland and the jet base at Brunswick.

• **Three gas sources**—Natural gas' approach to New England is threefold, to serve two companies. One of the two is Northeastern Gas Transmission Co., well-advanced on a 500-mile construction program to serve parts of Massachusetts, Connecticut and New Hampshire. Northeastern, a subsidiary of Tennessee Gas Transmission Co., has two sources: a completed 303-mile 24-in. line from Tennessee's former terminus near Buffalo, N. Y., to a connection with Northeastern at the New York-Massachusetts line near Pittsfield, Mass., and a proposed spur from Transcontinental Gas Pipe Line Co., at a point near Greenwich, Conn.

The second company is Algonquin Gas Transmission Co., which will get its supply at the Connecticut line from a proposed spur of the Texas Eastern line (the original Big Inch). Algonquin has begun construction on a line to serve the part of New England to the south and east of that to be served by Northeastern.

• **Southwesterners run show**—Be the jobs for liquid or gas, they have at least two common denominators—the machines used and the men who direct the work. One spread of equipment looks similar to another, and the construction firms' names largely are reminiscent of the ever-booming oil country: Oklahoma Contracting Co., of Dallas; H. C. Price, of Bartlesville; Associated Pipe Line Contractors, of Houston and Britton and Clarke, of Fort Worth. Then there is the world-wide operator, Bechtel Constructors of San Francisco (pipelining in the Northeast for the first time).

• **Yankees, too**—The northeastern construction fraternity doesn't sit with the sidewalk superintendent, however. New England contractors have fitted into some parts of the picture, particularly excavation. One of these contractors is W. H. Hinman, of North Anson, Maine, who dug trench for part of the Portland-Montreal line last year, and who did the same for the Scarsport-Limestone job this year.

Nor do the men all migrate from the wide open places. Superintendents, foremen, welders, and many machinery operators do, but a substantial part of the labor is local. On two spreads in eastern New York State, Bechtel has 375 local employees out of 450 working on the Tennessee gas line. And on the Canadian section of the Montreal pipeline last year the proportion was still higher in view of a government limitation on the number of southwestern experts who could be brought in to run the job.

• **Terrain problems**—Notorious for its stony soil, the northeastern terrain does not stump the pipeliners. They've been through rough country before—Tennessee, Kentucky and West Virginia, as well as in the western states.

However, the type of soil encountered does cut down on use of the pipeliner's favorite excavation tool, the trencher. Boulders and ledge rock put trenchers on the sidelines, but hills don't necessarily do it. If the hill material is ordinary dirt, the pipeliner helps the trencher by hauling it with a tractor winch.

The usual alternative to the trencher is the back-hoe. In rock it mucks after center-line holes have been blasted. Drilling, usually for blast holes not more than 4 ft. long, is done on many jobs by gang drills suspended from tractor side booms. As many as four drills are mounted together, usually on 3-ft. centers.

Once the excavation is ready, pipelaying proceeds pretty much the same as it does in level country. And it goes just about as fast—1-1½ miles a day.

Some innovations in pipe-bending have become commonplace in the past year, and extra tractive power is needed on the steeper slopes.

The slopes, of course, are heavy in much of the Northeastern work. To minimize their effect and find other location economies, the gas transmission companies make exhaustive preliminary surveys, using up-to-date aids such as aerial surveys.

(A sidelight that illuminates older location techniques is revealed by the fact that the Tennessee cross-state location in New York is only a mile or so shorter than U. S. Hwy. 20, which goes near both of the new line's ends.)

Bending practice now calls for smooth bending. Formerly, wrinkle-bending was specified because existing attempts at smooth bending resulted in localized drawing of the pipe steel down to unsafe thicknesses. Wrinkle bending, where the pipe wall on the inside of the bend is allowed to shorten with a series of wrinkles, did not possess this drawback. However, wrinkle bends impair the friction properties of the pipe, particularly in rugged country where many bends are inevitable. Bending that overcomes both defects has since been accomplished with the aid of vertebra-like clamps. These clamps distribute the drawing evenly over the bend, keeping wall thickness within safe limits.

• **Erosion control**—Another feature of current northeastern pipelining methods is the extent of erosion control practiced by contractors and owners. This control has the two-edged purpose of keeping the backfill from washing out of the ditch where grades are heavy, and of preserving the beauty of the countryside. (Therefore, helping residents to appreciate this new phenomenon in the region's economy.)

During construction, the contractors put "breakers" at intervals in the ditch where grades are steep enough for water to erode exposed earth. Breakers are check dams, made of bagged earth or broken rock. It takes 40 or 50 bags of earth to make a breaker. On one section, Bechtel has used 20,000 breaker bags in a two-month period of the current work.

After the ditch is backfilled, the pipeline owners give the right-of-way further treatment, in places even terracing it. Normal procedure is to harrow and seed the strip. In warm damp weather it is not uncommon for pasture land right-of-way to be well covered with grassy growth two weeks after the pipeline crews have gone through. Cultivated land is restored to its original contour.

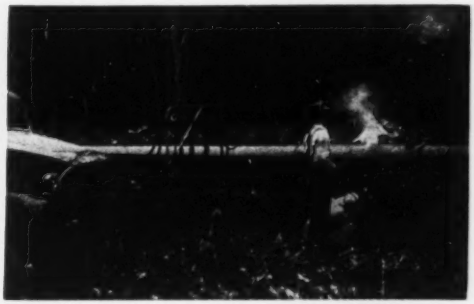
• **Old-pipe protection**—Another right-of-way practice is observed in some

looping operations. Looping is running a new line parallel to an old one. Such a job was the Portland-Montreal line, where new location ran as close as 8 ft. to the old. Because of previous right-of-way clearing, it was most convenient to work on the old-line side. This meant that in soft spots there was danger that wheels and tracks might damage the old pipe, even break it; considering an 800 psi flow of crude, a fiery mess might ensue. To reduce this danger, contractors put down "riffraff," or brush-mat surfacing. With this treatment, tractor lugs would not dig down and damage the old pipe. In fact there was no damage, even where ledge and boulders were blasted nearby. In gas work, other companies specify a minimum of 50 ft between new and old work.

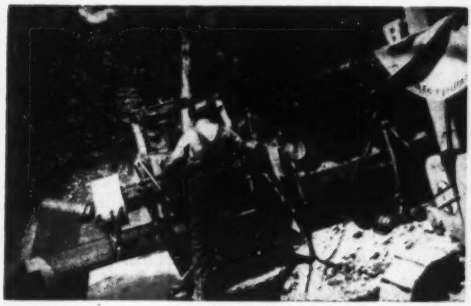
SMOOTH BENDING made its debut in pipelining last year. This horizontal bender is in use on the Canadian section of the 18-in. Portland-Montreal crude oil line. Mannix-Sparling-Fowler-Campbell Companies were the contractors. (ENR photo)

VERTICAL BENDER handles the curves on Bechtel Constructors' 125-mile section of Tennessee's New York State tie-in to supply New England with natural gas. Pipe lengths are measured to fit trench and bent on spot. (H. J. Guerin photo)

WELDERS PACE THE JOB—It is necessary to have substantial lengths of pipe welded ahead of the specialized machines that clean, prime, coat and wrap pipes. Here the familiar half-track carries welding machines on Canadian job. (ENR photo)



SWAMPS AND RAIN don't stop welders. This is an H. C. Price crew on New York State tie-in, in swamps north of Lake Cayuga. On 24-in. line, crews of these experts work four joints at a time to complete 250 welds in a day. (ENR photo)



COAT AND WRAP machine works Northeastern slopes and Texas plains with equal facility. Side-boom tractor is the pipeliner's tool of many jobs, provides extra power for heavy going. Bechtel is the contractor here. (H. J. Guerin photo)

"HOLIDAY" DETECTOR gives pipe covering a final check. This detector, used by Associated Pipeline Contractors in Vermont, is a circular spring carrying an electric charge. When it sparks it reveals a flaw (holiday) to be repaired. (ENR photo)

REPAIR MANEUVER—Buoyant halves of pile-repair caisson move toward defective pile. Clamped together and dewatered, they will provide dry space for effective encasement with new concrete.

Caisson takes guess out of pile repairs

I. Leon Glassgold
Chief Engineer
Masonry Resurfacing & Construction Co., Inc.
Baltimore, Md.

A LASTING REPAIR for concrete piles—that was one objective specified by the State of Maryland when it took bids on a bridge improvement job near Easton, Md.

The objective was reached with the aid of a caisson that surrounded a pile, enabling encasement repairs to take place in the dry.

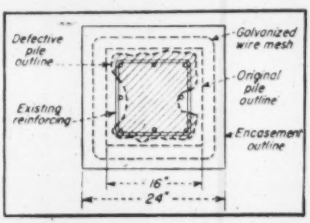
By former methods, restoration involved a series of steps that were plagued with uncertainties. Chipping bad concrete, setting a mesh reinforcement cage, erecting forms and in some cases placing new concrete took place partly below water. Here the work might be invisible, leaving the effectiveness of each step in doubt.

The condition that was corrected is a familiar one where bridge or pier piles stand in water. Within the zone of water-level fluctuation the concrete is attacked by a variety of factors, including freezing and thawing, and chemical action.

After fifteen or twenty years the piles "neck" down in the surface-level zone, sometimes leaving reinforcement exposed, or losing concrete section altogether.

A hundred square 16-in. concrete piles were in this dangerous condition on the Easton project. Crossing Peachblossom Creek, the old 500-ft bridge had a 15-ft, 6-in. roadway. The roadway was to be widened to 28 ft. with the extra width on new concrete piles.

This was not the first time the old piles had been repaired. In 1926, about 11 years after the bridge was built, the state tried to correct the "necking" condition. The job was done by hand-cleaning the concrete, surrounding it with chicken wire, building a box form, dewatering the form and filling it with concrete.



REPAIR DESIGN—Shaded zone of cross-section outlines a typical damaged pile's condition. Repair increases size from 16x16 in. to 24x24 in.

Under this year's contract the old piles were to be repaired under the following specification:

"Pile repairs must be done entirely in the dry. The contractor must develop an approved caisson to envelope the pile which shall be dewatered to permit the cleaning of the pile within the caisson. The caisson must be dewatered during all operations. All deteriorated concrete must be removed and even where the existing concrete is not deteriorated it shall be removed to depth of 2 in. to provide bond."

The following results were to be obtained:

1. Good bond between old and new concrete so the repair will remain in place and become an integral part of the pile.

2. Inhibition of scouring, so reinforcing rods will be protected for a longer period of time.

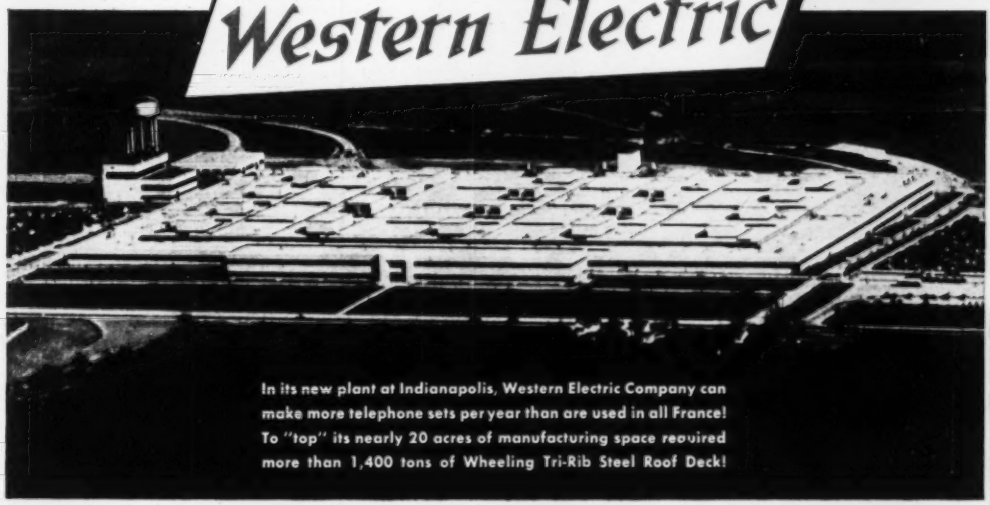
3. Improved resistance to freezing and thawing, through use of durable concrete.

Performing the repair in the dry made it possible to assure a good bond, free of weakening films of scum. Ex-

(Continued on page 53)

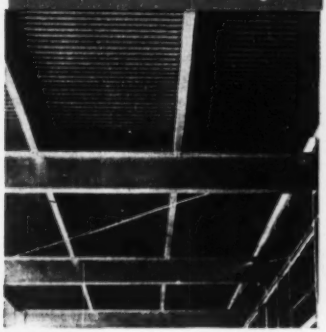
A ROOF DECK OF STURDY STEEL FOR

Western Electric



In its new plant at Indianapolis, Western Electric Company can make more telephone sets per year than are used in all France! To "top" its nearly 20 acres of manufacturing space required more than 1,400 tons of Wheeling Tri-Rib Steel Roof Deck!

IT'S LIGHTER!



Wheeling Tri-Rib Roof Deck saves weight two ways: because of the lightness of the sheets themselves, and because the smaller dead load of the roof permits lighter supports.

IT'S FASTER!

Tri-Rib Sheets save time, too — through easy handling, and quick fastening by welding or clipping. The Tri-Rib method also requires less time out due to bad weather.

IT'S LOWER-COST!

A Tri-Rib roof costs less. Saves money too, in allowing lighter supports. Made of Cop-R-Loy, Tri-Rib is designed to specifications adopted by A.I.S.I. for light gauge structures.

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For complete data, consult Sweet's Files or write us.

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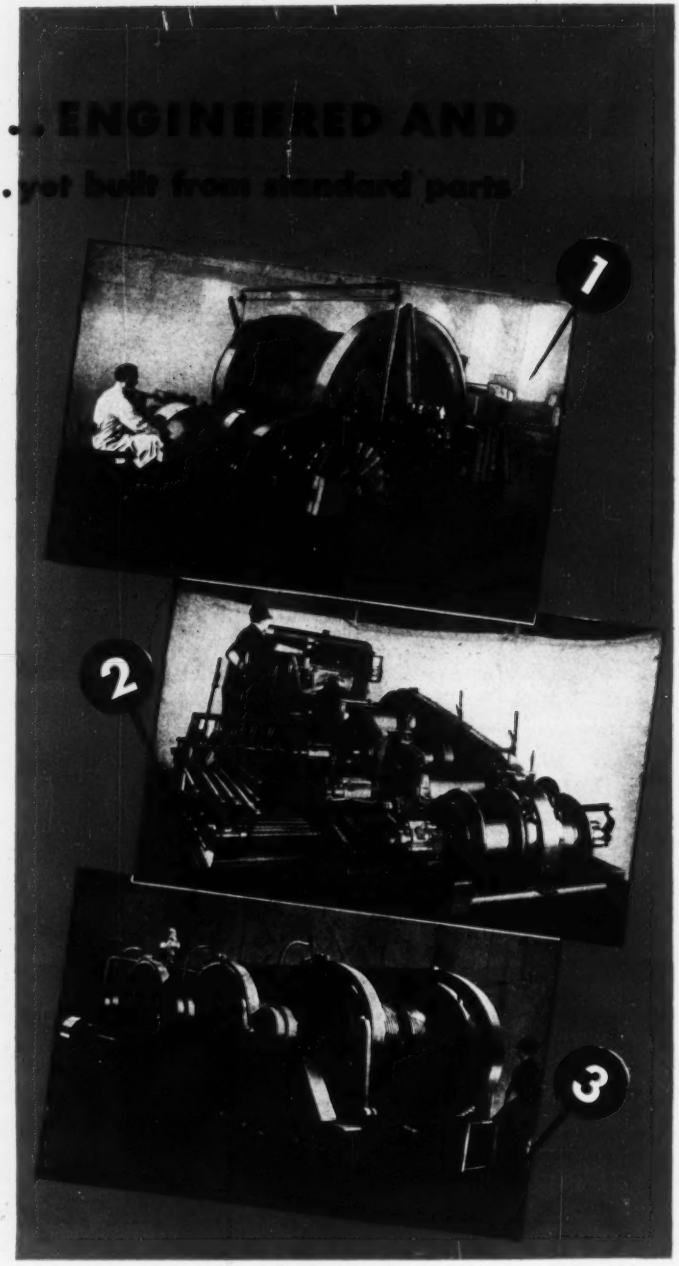

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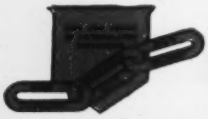

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Caisson aids pile repair

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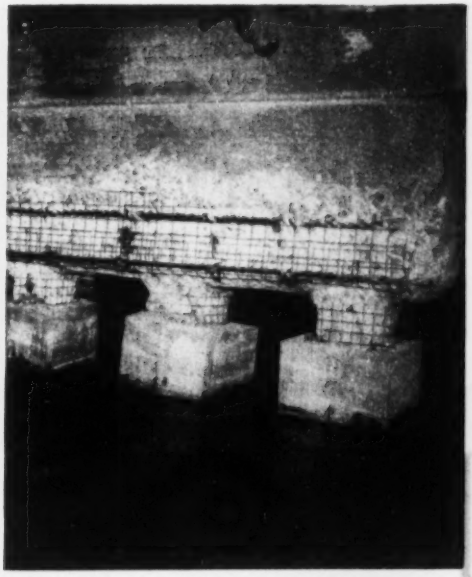


ENCASEMENT COMPLETE—These pile repairs have been formed and poured inside caisson. Final step will be gunite build-up on exposed wire mesh.

(*Continued from page 50*)

tra section (see drawing) plus leaving galvanized metal forms in place, inhibited scouring. The third objective was reached with a 7.5-bag per cu yd mix and 5 gallons of water per bag. Cement was an air-entraining type.

• **Earlier experience**—The contract was awarded to Masonry Resurfacing & Construction Co. This firm previously had done a similar job for the Baltimore & Ohio Railroad at its Curtis Bay coal pier near Baltimore. On that work, 800 square 15-in. piles had been encased. Tooling up for the new job merely meant modifying the caisson.

• **Detachable cofferdam**—The caisson consists of two buoyant halves that clamp together about the pile to form a sort of detachable cofferdam. It is open at the top and bulkheaded to fit the pile's full (undecayed) section at the bottom. The caisson is so sealed that little or no water can enter.

There is room enough inside to allow a man to work, once the caisson is dewatered. Moreover, inspectors can maintain a positive check on procedures and quality. During work on a pile the caisson can be held so that minor water level variations don't disturb it.

• **Repair work**—The tide during this Peachblossom Creek work varied 3 ft, and while it did overtop a caisson occasionally, it did not hamper work.

Inside the caisson, a man chipped concrete with an air hammer. After the condition of reinforcement was appraised and any necessary repairs were made, wire mesh was anchored to the pile. Next, the metal form was set. This form was supported independently of the caisson, with form bottom at least 6 in. above the caisson floor. Thus, caisson movement or water on its floor would damage neither the form nor fresh concrete.

Concrete was chuted to forms from one side of the bridge deck. Once the concrete was in place the caisson was flooded and detached for movement to its next pile position.

The final substructure repair step in each bent was to build up the pile tops and the cap with gunite.

• **Peachblossom difficulties**—Working conditions were far from ideal, as the following experiences will indicate.

Water depth varied from 1.5 ft to 7 ft, so that at 75% of the piles mud and sand had to be removed. Excavation for a particular pile had to be finished just prior to the setting of the caisson, since the tide would wash mud and sand back around the pile almost overnight.

Moreover, many piles had the remains of old repairs on them. These slowed both caisson-setting and the repairs themselves.

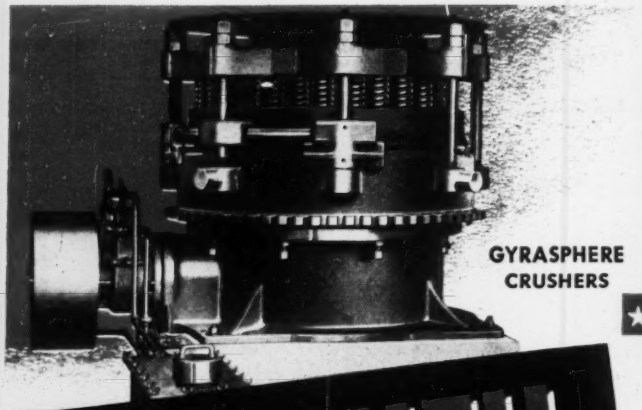
In many places, twisted or inclined piles reduced the space between piles, so there wasn't enough room for the regular caisson. Here, a special thin caisson (which nevertheless had room for a man) was used.

This last-named difficulty touches on what is perhaps the most important limitation of the caisson method—the limitation imposed by pile spacing. Piles may be too close together to allow the smallest caisson to fit. Or there may not be maneuvering room for the caisson during setting.

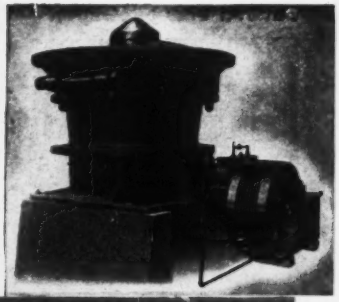
Another limitation is the obvious one that would be imposed by unusually high tide ranges.

Masonry Resurfacing & Construction Co. calls the overall method described here "DRI-POR." The firm has patents pending on the caisson and its various features.

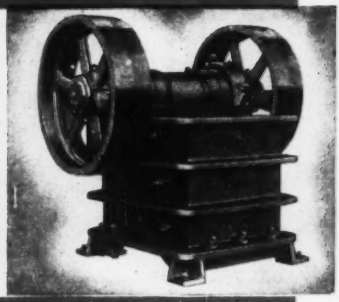
• **Management**—The Peachblossom Creek bridge work was designed by the bridge engineering department of the Maryland State Roads Commission, under the supervision of A. L. Grubb, engineer of bridge design. Design of the restoration equipment and methods for this job was done by S. S. Glassgold and the writer. The latter also supervised the work in the field.



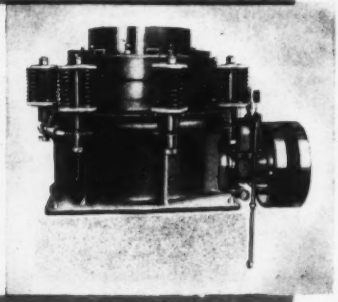
GYRASPHERE CRUSHERS



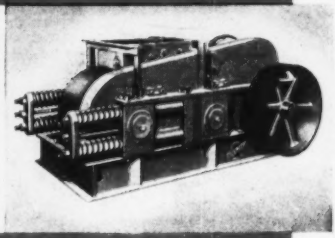
★ GYRATORY BREAKERS



★ JAW CRUSHERS



★ INTERCONE CRUSHERS



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Research buildings of metal and glass

AT FIRST GLANCE, three buildings completed last month at the General Motors Technical Center near Detroit seem to be all glass. A closer look, however, discovers structural framing and glossy metal spandrels; also, that two of the structures have unusual glazed-brick end walls.

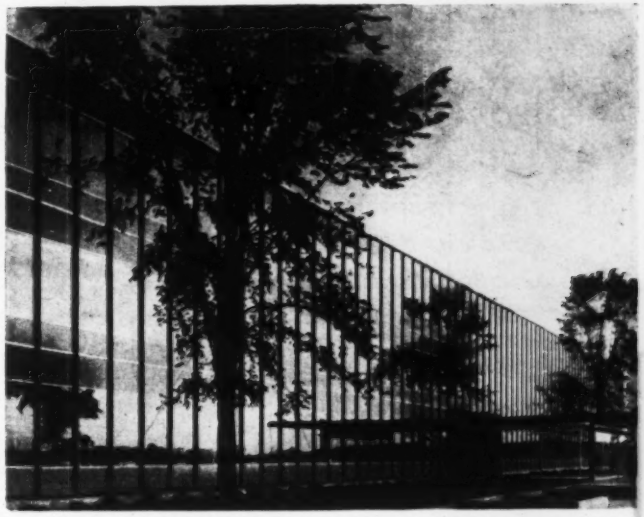
Steel columns are exposed on the exterior of the buildings. These structural members are slender, making the structures appear taller, yet not interfering with the feeling of transparency imparted by the large areas of glass. In one building, the columns also serve as mullions.

• **Thin walls**—Spandrels are faced with porcelain-enameled steel—both on the exterior and interior. Of sandwich construction, they are 2-in. thick panels, the metal facings being bonded to a resin-impregnated paper, honeycomb core. With no metal-to-metal contact, the panels have good resistance to heat transmission. This was improved even more by filling the honeycombs with a granular insulation.

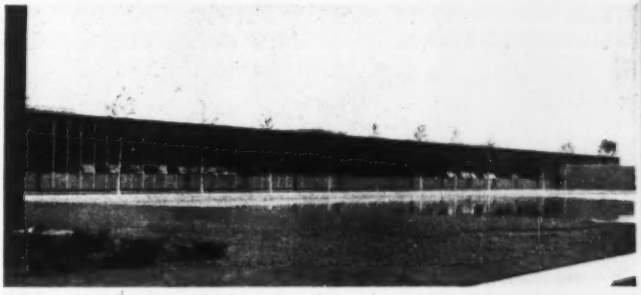
• **Large building program ahead**—The buildings will be occupied by the Engineering Staff of General Motors Corp. They are the first of five groups to be built on an 813-acre site north of Detroit, at Mound and Twelve-Mile Roads. Eventually, the area will contain the GM Research Laboratories Division, Process Development Section, Styling Section and a Service Center. The project is expected to be completed in the next two or three years.

At this time, it is about 40% finished. The Engineering Staff buildings, main power house, several small utility buildings and gate houses are now in use. In the Research Laboratories group, a metallurgy building, housing an experimental foundry, will be completed in the near future; a dynamometer building is half finished, and ground has been broken for a shop building. Also under way is a shop building for the Technical Center staff.

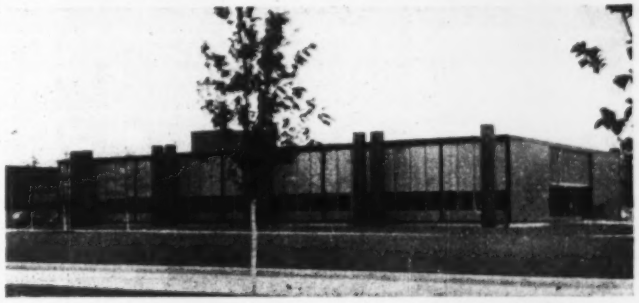
First major technical group to move into permanent quarters on the site, the engineering staff will do independent development work, as well as service the various GM divisions. It occasionally readies for production new devices resulting from work of the research laboratories. It is responsible for development of designs for



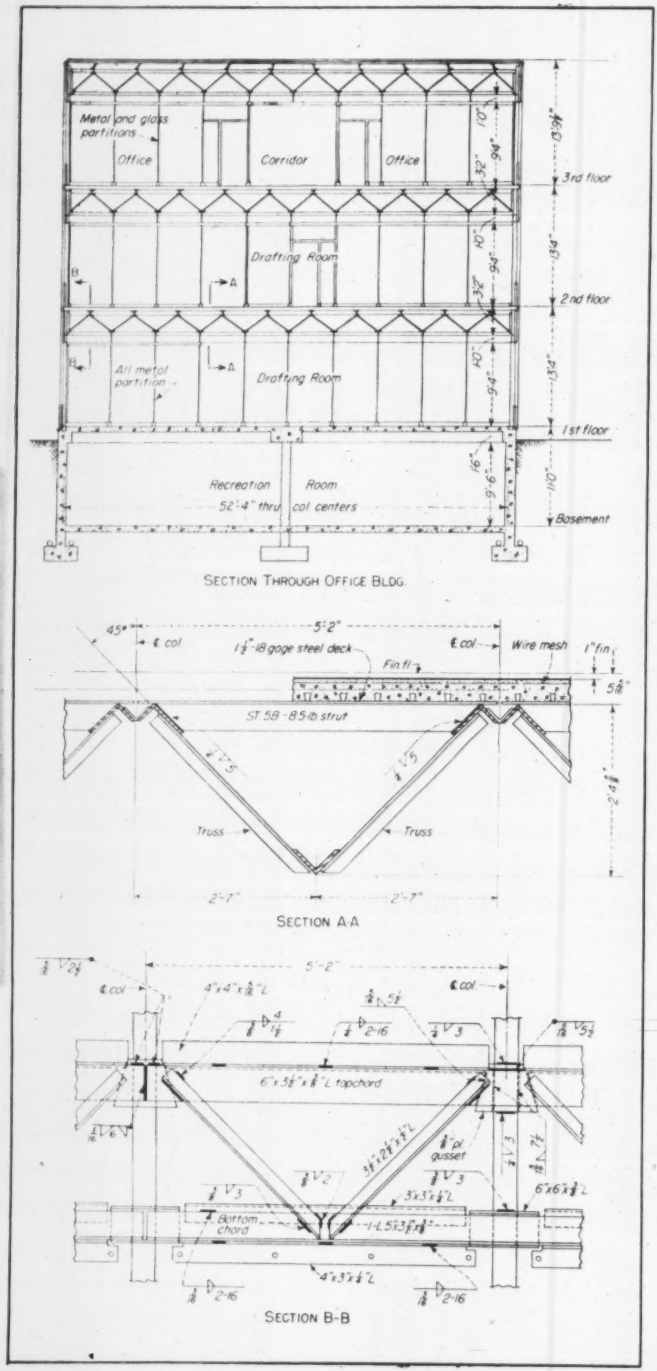
OFFICE BUILDING at GM Technical Center—Columns double as mullions. The windows are double-glazed. Above and below them are porcelain-enameled metal panels, which are bonded to an insulation core.



SHOP BUILDING—Windows contain over 50,000 sq ft of heat-absorbing glass.



DYNAMOMETER BUILDING—Walls are new-type brick or insulated metal panels. Stacks in front are for exhausting fumes from test rooms inside.



TRIANGULAR TRUSSES welded to tubular columns form rigid frames, eliminating the need for interior columns in the 53-ft wide office building.

cars, structures and suspensions, transmissions, power and automotive ordnance.

The three structures built for this staff are office, shop and dynamometer buildings.

• **Triangular beams**—The office building is three stories high, 53x370 ft in plan. On the north and south sides, it has double-glazed windows with a ½-in. hermetically sealed air space between the panes. The outer pane is ¼-in. thick, heat-absorbing glass. There are no mullions; glass is framed between columns, which are spaced 5 ft 2 in. on centers. Panes are 56 in. wide and 7½ ft high.

Columns are composed of pairs of 4x8-in. angles with edges welded together to form hollow, rectangular tubes. They were welded to floor and roof beams.

There are no columns in the middle of the building. Hence, beams had to be designed to span 52 ft, though space between floor and ceiling had to be kept to a minimum and yet air-conditioning ducts and utilities had to be accommodated.

The solution was found in floor members of unusual shape—trusses triangular in cross section with apex down. Each truss is 29 in. deep. The base of the triangle is 5 ft 2 in. wide, the corner angles framing into the columns.

• **New-type brick**—Exterior walls at the ends of the office building are built of bright red glazed brick. The facing, which was also used at the ends of the dynamometer building, but in bright orange, was developed by the architect and manufactured exclusively for this project. It is a ceramic-glazed, sand-molded, shale brick.

Standard glazed brick are made of fire clay and usually are extruded; they are regular in shape, smooth surfaced, not particularly glossy. Choice of colors is small. This type of brick was used in the interior of the buildings.

For the exterior, the architect wanted a facing in large scale in brilliant color. Shale brick met his requirements; colors are brilliant and very glossy.

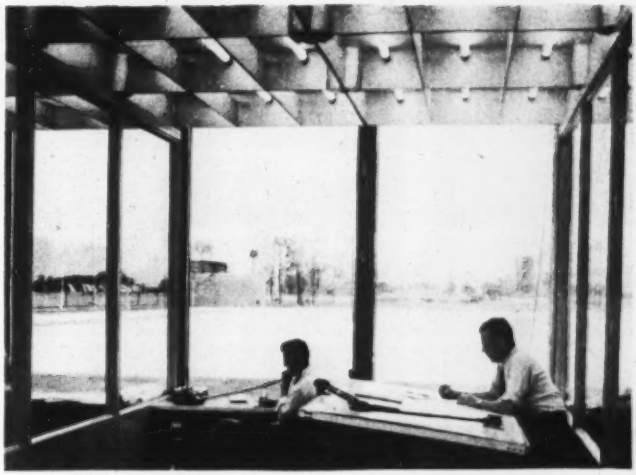
• **Modular design**—The exterior of the office building offers clues to the design of the interior. The fixed 5-ft 2-in. spacing of exposed exterior columns marks the boundaries of modules, or basic units, on which the interior design was based. The large window areas indicate the attention given to interior lighting. And the colored face brick show the consideration given to decorative color.

The module used throughout the office building is a 5-ft 2-in. square.

Movable partitions for dividing up office or drafting room space may be placed on any module boundary. Each module is an independent unit with regard to lighting, heating, ventilating and sprinklers. Rooms have individual controls for the high-velocity air-conditioning system.

Full-size mockups of vehicles may be moved to any location in the building for engineering study. They can be lifted or lowered to any floor level on a freight elevator. Room partitions fold back to create enlarged entrances from corridors.

Natural lighting is supplemented in the interior by fluorescent lighting. To obtain uniform lighting with a minimum of glare, the lamps were inserted in deep recesses in the suspended ceiling, and vertical metal baffles were placed below them. Illumination in drafting rooms is maintained at 90-ft-candles.



OFFICES are formed with movable partitions. Lighting and air conditioning units are repeated in each 5-ft 2-in. square module. Baffles shield fluorescent tubes in the ceiling.

• **Flexible layout**—The shop building is similar in design to the office building, to which it is connected at first-floor and basement levels.

One story high, the shop is 570 ft long and 160 ft wide. It has one row of interior columns. Roof trusses, spanning 80 ft, have a 14-ft clearance above the floor.

A 20-ft corridor extends the length of the structure, separated from the various shop areas by sliding partitions. To make maximum floor area available on the first floor for experimental work, locker rooms, general stock room, wash rooms and maintenance facilities were placed in the basement. Heating and ventilating equipment are in three penthouses above the corridor.

Interior partitions are movable, designed to be shifted easily when space has to be re-arranged. In addition, water, air and electrical outlets are located for maximum flexibility in subdivision of space.

Similarly, the main floor of the dynamometer building is completely cleared for test operations. This 100x180-ft structure contains test cells for engine, transmission, chassis and fuel-system development work. Essentially one story high, it has a penthouse for heating and ventilating equipment, and the basement contains motor-generator sets, control equipment and separate engine-exhaust ventilating systems for each cell. Dynamometer foundations form cell vaults in the basement, each vault being connected to an exhaust stack outside the building.

Normal heating and ventilating of dynamometer cells is achieved with a low-velocity system. In addition, intake air for cooling engines enters the rooms through the ceiling to form a curtain around the bed plate in each, to shield cell operators from heat and fumes.

The three buildings were designed by Saarinen-Saarinen and Associates of Bloomfield Hills, Mich., with Smith, Hinchman & Grylls, Inc., of Detroit, as architect-engineers. Bryant & Detwiler Co., of Detroit, was the general contractor.

Seek approval for parkway along the Potomac River

Approval of a Parkway from Great Falls on the Potomac River above Washington to Cumberland, Md., was recommended to Congress in August by the Interior Department when it submitted a report on the project prepared jointly by the Bureau of Public Roads and the National Park Service. Congress had authorized a survey of the project in 1948 (ENR April 29, 1948, p. 72).

The projected Potomac River Parkway, 168 miles long, would be entirely on the Maryland side. Leaving Washington it would follow the right-of-way of the old Chesapeake & Ohio Canal, which was bought by the federal government in 1938 at a cost of $2 million.

Initial plans call for a single 24-ft pavement with 8-ft shoulders, except for the first 25 miles out of Washington, where a two-lane divided roadway would be built. Surfacing would be 2-in. of asphalt concrete on a 9-in. base of crushed stone or gravel. Costs are estimated at $16,102,000 for road construction, $319,000 for canal restoration, $104,000 for restoration of the old canal buildings, and $552,000 for new buildings and appurtenances.

Roadway estimates include rehabilitation of old culverts under the canal and canal viaducts, construction of overhead bridges and parking facilities at recreational areas. The old 3,000-ft canal tunnel near Kiefer, Md., could be used for one roadway with a minor amount of cleaning up.

This proposed parkway was the subject of some critical comment at the recent annual meeting of the Interstate Commission on the Potomac River Basin. Objections centered around the present plans for the parkway that call for Maryland to purchase the 10,000 acres needed for right-of-way in addition to the 5,250 acres in the old canal right-of-way. This would be deeded to the United States, with the result that property on that side of the river in Maryland, for nearly 170 miles, would be cut off from access to the river by a strip of federal land. Local business groups fear that this might put a serious check on new industrial developments.

Other speakers favored the parkway as providing construction jobs in areas where there is unemployment.

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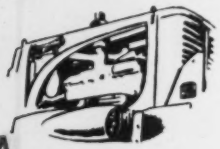

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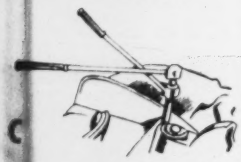

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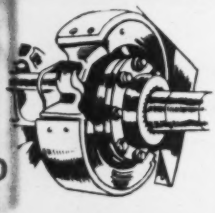

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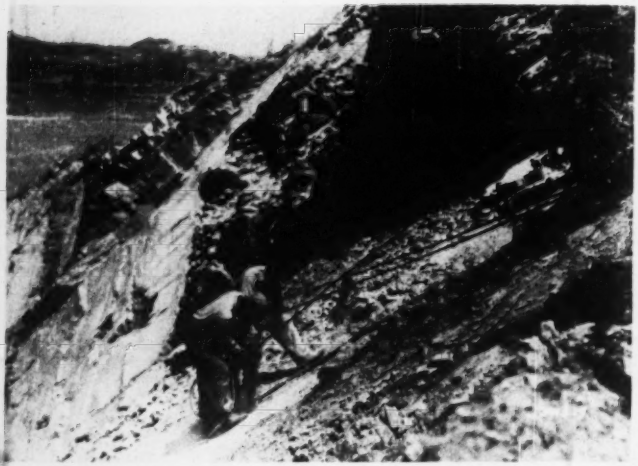


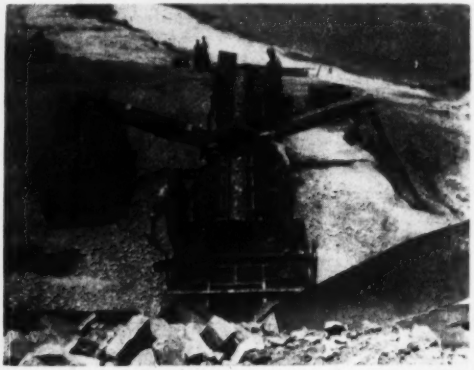
DRILLING THE FACE—Aggregate for roads in Korean combat area is quarried from the hills. Here men working for the 453 Engineer Construction Bn., U. S. 8th Army, use an air drill face of a rock cliff preliminary to blasting.

Delay after delay has snarled Korean truce talks since negotiations between U. N. forces and Korean Reds began. But east of Kaesong, U. N. forces have maintained a slow steady pressure, punctuated by limited objective thrusts into Red-held territory north of the 38th parallel.

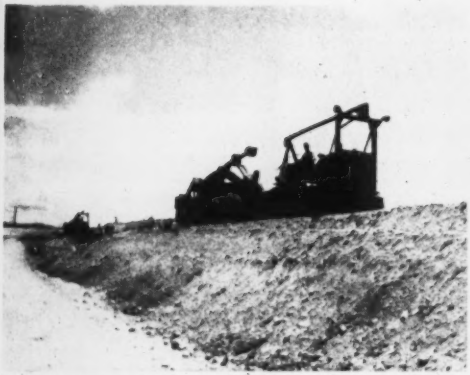
Behind these lines throughout the U. N. theater of operations in Korea, there is of course an intricate system for moving supplies and personnel to maintain units on the fighting front. The system depends on fast-moving transportation, by far the largest part of which is trucking.

One of the important jobs of U. S. Army Engineers is construction and maintenance of the roads and bridges that carry this transportation. It is a

BLASTING FOR ROCK—Holes drilled, and TNT charges loaded, the charge in the rock face is detonated. Loose rock from the blast can be gathered by bulldozers.



CRUSHED TO SIZE—This portable crushing unit has a capacity of about 50 tons per hour and can handle rock up to 12 in. diameter.



GRADING THE ROAD—Taking a cut and filling a roadway, this 12-cu-yd scraper of the 323rd Engineer Co., U. S. IX Corps, grades a new military highway toward the Red front.

MAKE ROAD BASE—Crushed rock hauled to a road site in the tortuous Korean mountains is dirtributed to form a road base by engineers of the 7th Infantry Division.

set rugged pace military roads

relentless, never-ending assignment, and often a heart-breaking one because its importance to efficiency on the battle front is sometimes undervalued.

The photos on these two pages show a sample of one part of the Army Engineers' job—roadbuilding.

Military traffic can batter a road to pieces in a few hours. Better-built highways receive more abuse in a few weeks from convoys, particularly armored units, than they would normally receive in years. Secondary roads can be reduced to rutted quagmires impassable to lighter vehicles, by a single convoy of medium tanks.

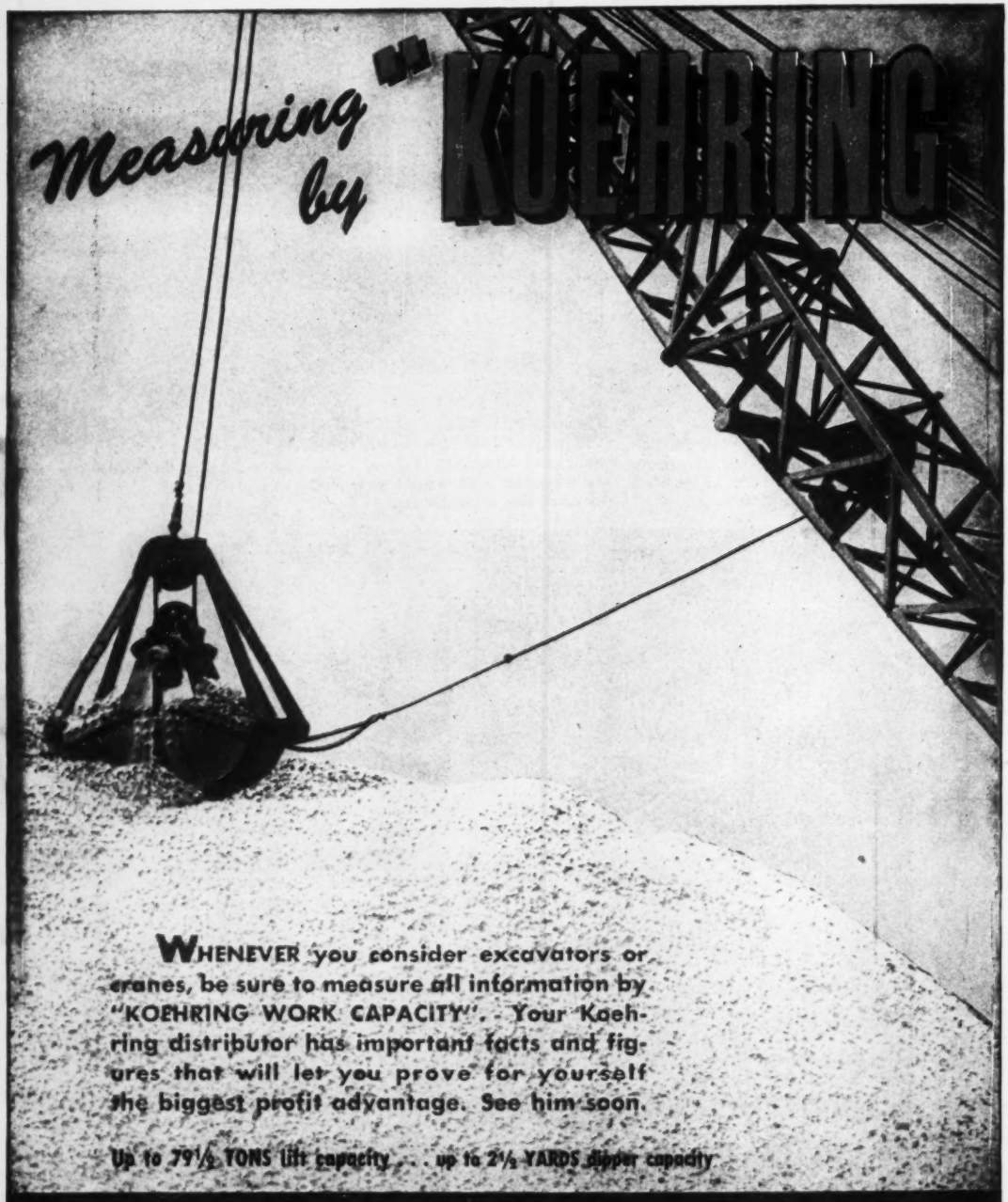
Here is a picture story of the work going on in Korea today. The photographs are from the files of the U. S. Army Corps of Engineers.

INTERRUPTION—This engineer construction crew near the northeastern front was interrupted by Communist snipers during a road building job. Using the bulldozer for cover, they return the fire.

BUILD CRIBBING—Men from an engineer battalion with the 8th Army construct cribbing to support a fill which will straighten and flatten a sharp road curve.

WIDEN CULVERT—Near Inchon, men of Co. B, 3rd Combat Engineer Bn. widen a road culvert to carry two lanes of military traffic.

ENROUTE TO THE FRONT—Over a roadway improved by engineers, units of a Field Artillery Observation Bn. Counter-Battery Radar Section speed to the fighting front.



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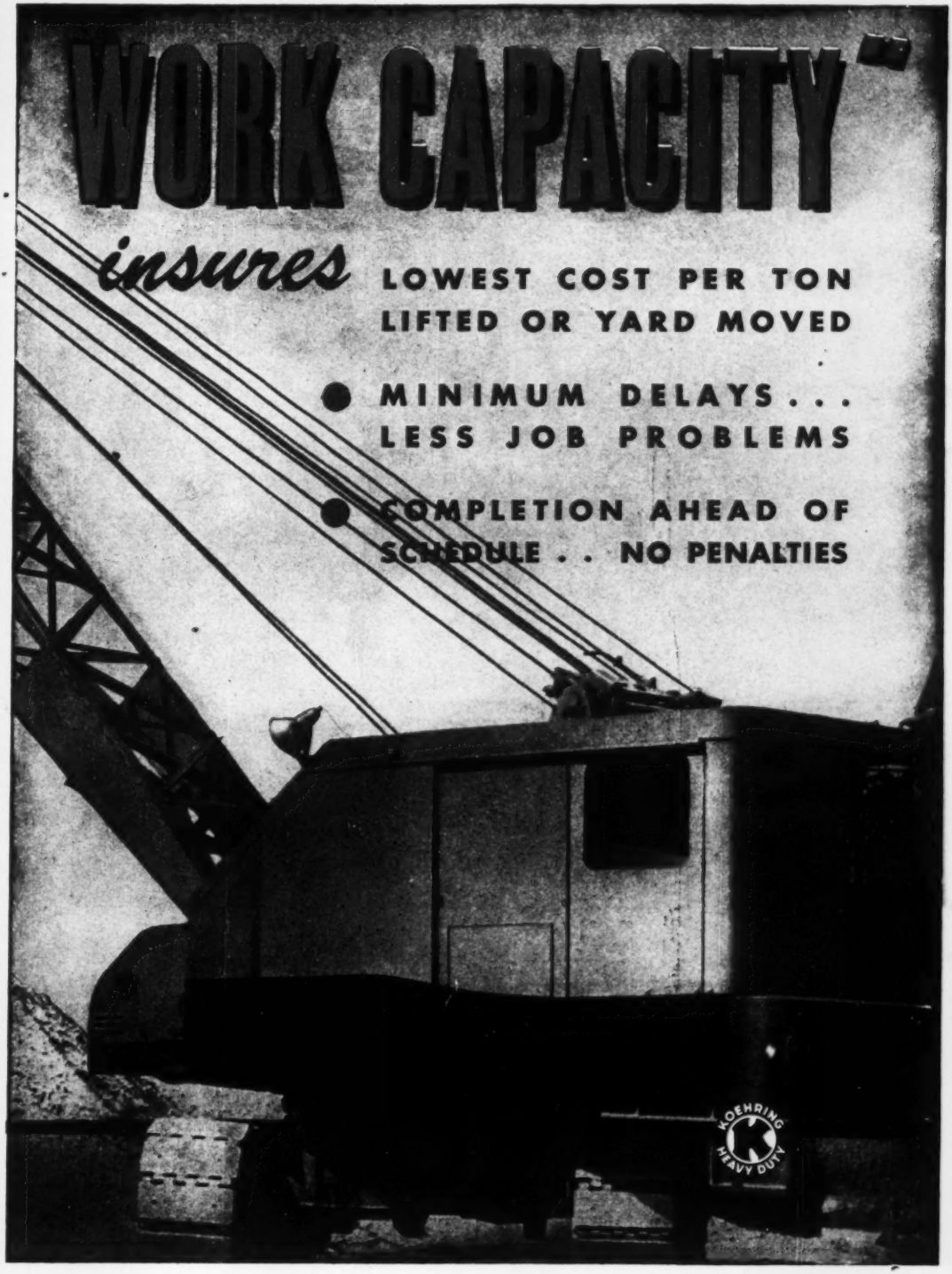
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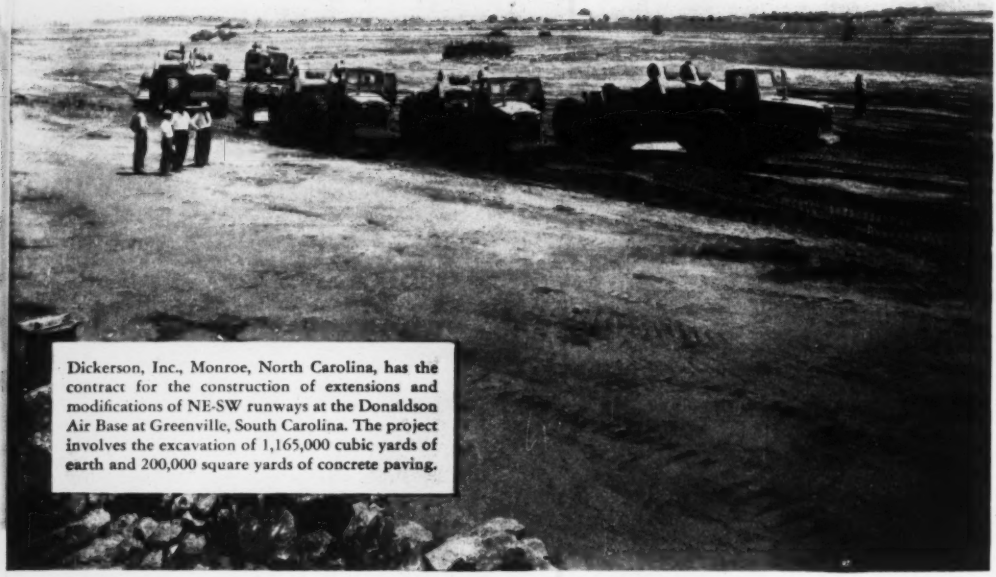

Dickerson, Inc., Monroe, North Carolina, has the contract for the construction of extensions and modifications of NE-SW runways at the Donaldson Air Base at Greenville, South Carolina. The project involves the excavation of 1,165,000 cubic yards of earth and 200,000 square yards of concrete paving.

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READER COMMENT

Cheating in exams

Sir: My husband called my attention to the article about cheating in examinations. I wrote the author, Prof. F. T. Mavis, that "Ever since the West Point dismissals, we have read many comments, but nowhere has there been such a fine, concrete, and constructive statement."

For your part in the matter, please accept my thanks for printing such a fine item.

MARGARET C. GANNETT
Shaker Heights, Ohio

Teaching of Prestressing

Sir: I was more than glad to see Jacob Feld's sober and levelheaded comments on the state of prestressed concrete in this country (ENR Oct. 11, p. 48). Like Mr. Feld, I am thoroughly convinced of the proven technical soundness of such construction. But, again like Mr. Feld, I have long maintained that American conditions of relative labor and material costs will require techniques to be developed that are entirely different from those current in Europe, to make this construction method competitive here.

During the last year or two, considerable pressure has been exerted on technical schools to introduce special courses on prestressed concrete, preferably an entire course to be included in the required, undergraduate curriculum. Equally, pressure has been exerted on such schools to engage in large-scale research on prestressed concrete. I have resisted these pressures, as far as they relate to extensive teaching of this subject.

The basic principles of mechanics as they apply to prestressed concrete and the stress distribution in it are simple and can be explained in outline in one or two lectures. This is being done in our required course on reinforced concrete. Most likely, it is also being done at many other schools. Such a discussion, plus a thorough grounding in general mechanics and structural analysis, will enable engineering graduates to follow intelligently those developments in prestressed concrete that are certain to take place in this country during the next decade or two.

To spend time, in an already overcrowded curriculum, on a detailed description of European methods of reinforcing and prestressing seems entirely out of place, in view of the fact that these "watchmaking" methods, as Mr. Feld so aptly calls them, will need thorough modification to be competitive in our market. In an advanced, elective concrete design course some additional time may be spent on this topic, as is being done as a moderate part of such a course here at Cornell.

With respect to research, it is certainly true that there is a place for additional work in this country. However, European research in this field has been very extensive and, on the whole, admirable. The development of prestressed concrete under American conditions is hardly hampered by lack of research information. It is rather the lack of cheap methods of prestressing, susceptible to mass application at small labor cost, which is retarding this evolution. The development of such techniques, in this writer's opinion, is hardly an undertaking that should be carried out by research men in engineering schools. It is a task for those who are close to the job, that is for contractors, trade associations and all those who are competitively interested in developing this field.

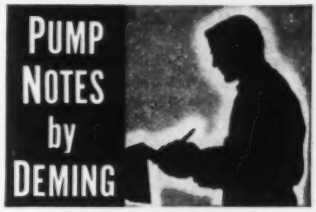
On the other hand, it is certainly a legitimate undertaking for engineering schools to institute research projects designed to fill gaps in our basic knowledge of the performance, under load and otherwise, of prestressed concrete structures. The high-strength materials more current in this country than in Europe, among other factors, may easily bring to light problems for basic inquiry which have not been investigated by the European researchers.

The schools will have done their job for the progress of prestressed concrete if they acquaint all of their students with the bare, basic structural principles involved, if they give their more advanced and especially interested students a chance to acquaint themselves in more detail with the present state of the art, chiefly abroad, and if they contribute to the solution of such genuine and basic research problems as may become apparent in this field. No more seems to be advisable at this time.

GEORGE WINTER
Cornell University
Ithaca, N. Y.

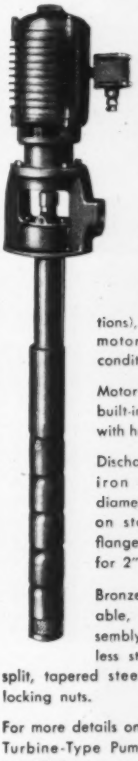
Correction

Length of the precast bridge at Placida, Fla., was erroneously given as 40 ft in ENR Oct. 4, p 37. Correct length is 405 ft.



INDUSTRIAL SOLVENT PUMPS

Deming Fig. 4703 (illustrated) is a vertical turbine type pump designed for pumping gasoline, oil and industrial solvents from underground tanks or from tanks located above ground where it is desirable to have pump located at top of tank.



Capacities range from 15 to 75 G.P.M. for pressures up to 100 lbs., depending upon capacity.

Single or three phase motors with ratings from ½ to 2 H.P. are optional in vertical solid shaft explosion proof type (for hazardous conditions), or standard open type motor (for non-hazardous conditions).

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Discharge head of heavy cast iron construction has 9" diameter base for mounting on standard 4" companion flange. Discharge is threaded for 2" standard pipe.

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INTERNATIONAL

TIGRIS AND EUPHRATES TAMED—Nearing completion is the Habbaniyah flood control and storage scheme, a British engineering enterprise in Iraq, the ancient Mesopotamia, which will give the country one of the finest irrigation systems and prevent flood damage from the Tigris and Euphrates rivers. Now floods will be averted and water stored to irrigate 2,500,000 acres which will yield big crops of wheat, barley, rice and cotton. Picture shows Hamza Amin, Iraqi's resident engineer, and Richard Lewis of Coode, Vaughan–Lee, Frank and Gwyther inspecting the heavy sluice gates regulating the flow of water through the Dhibban Channel outlet—Combine photo.

Building research stressed at London

Robert F. Legget

Special report to Engineering News-Record

Building research was given formal international recognition at the Building Research Congress held in London, England, recently. Attended by more than 1,300 engineers, architects and builders from 50 countries, the congress brought together the latest ideas regarding modern building design and techniques from every part of the globe but one. The U.S.S.R. was not represented, although Poland and other neighbor countries had delegates there. The absence of Russians was noted with regret by several speakers.

The impressive closing session was held in the Royal Festival Hall, one of the central features of the South Bank Exhibition, the acoustical design of which was specially explained to interested delegates. It was well demonstrated to the congress at a special symphony concert held in the hall.

President of the congress was Viscount Samuel, one of the "elder statesmen" of England. Chairman of the British Parliamentary and Scientific Committee, by his speeches at all the main functions of the congress he set a high standard for the proceedings, reminding those present of the social significance of their work.

Alistair Macdonald, a leading British architect, was chairman of the organizing committee of representatives of all branches of the building industry of Great Britain, including the trades unions. F. M. Lea, director of the British Building Research Station, which was a pioneer in building research, gave the opening address, reviewing the history of research in the building field and outlining the main avenues along which work now proceeds. Sir Ben Lockspieser, head of Britain's Department of Scientific and Industrial Research, reviewed the building scene as he saw it as a scientist. He contrasted the advances in mechanization, in particular, in other industries with that in the building industry and suggested ways in which he thought the industry, and architects, might profit from modern research methods.

About one hundred papers were presented. These were generally of a review nature but many contained new material and most of them pro-

(Continued on page 71)

PITTSBURGH
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NEW ORLEANS
MINNEAPOLIS
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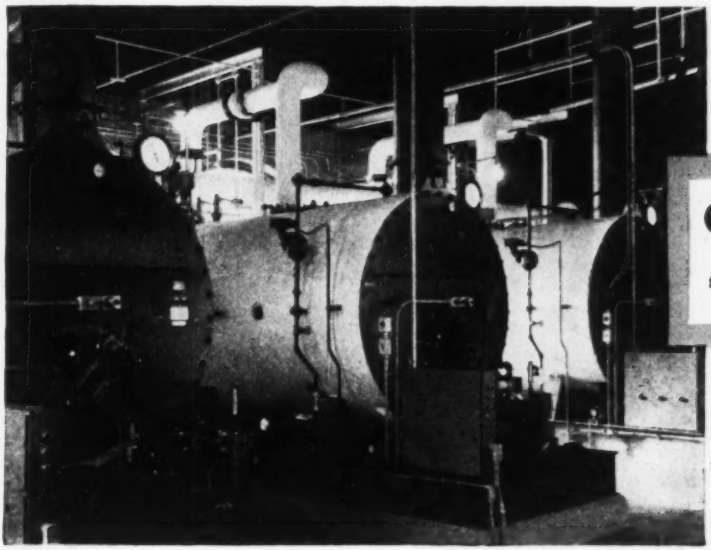

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DESIGNED FOR YOUR JOB

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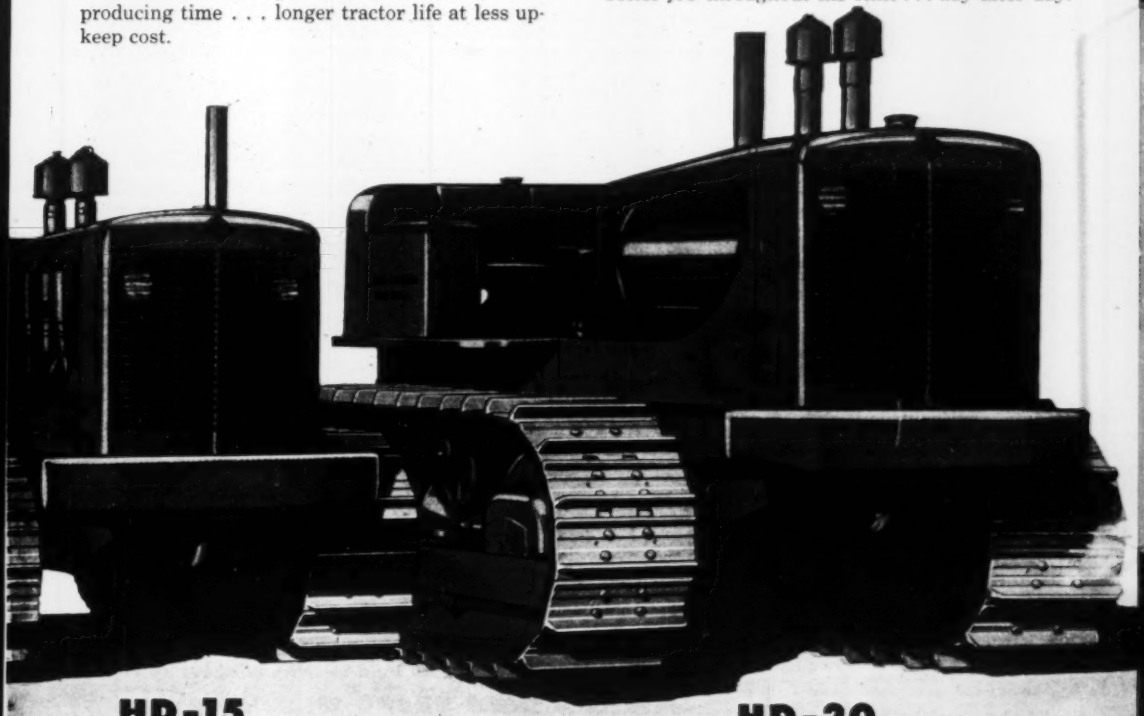

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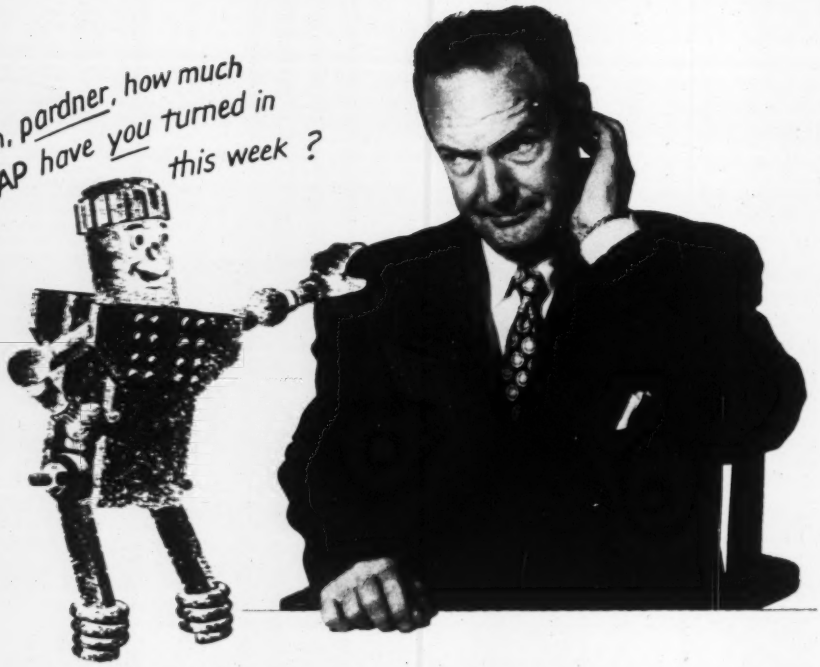

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The bulk of this scrap must come from industry. That's why we're asking for your all-out help. That's why it's so important that you make the drive for scrap part of your daily operations. Make it your business to encourage every employee to report any obsolete, broken or worn-out machinery, tool or equipment that has seen its day. From this dormant "junk" must come the heavy melting scrap that the mills need most. Don't let your scrap lie idle; send it on its way. How about it, pardner?

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UNITED STATES STEEL

vided the basis for discussion. Generally they were arranged in three main divisions, dealing with design and structure, materials, and the equipment and functional use of buildings, respectively. Meetings of the three divisions were held concurrently, in different engineering institutions around London, so that the technical part of the congress really resolved itself into a series of specialist meetings. All were well attended; all were excellently run, the presentation of papers being limited to about ten minutes each, thus leaving most of the time available for discussion.

Discussions on materials were informal and probably the most informative. Those on the equipment of buildings, and especially heating and ventilating, were the most technical. One whole day was given over to discussion of papers on advances in housing, but the main result of the discussion was to make clear that there is no short and easy path to more economical housing and that most countries share the same difficulties in this important subject.

Pre-stressed concrete came in for its full share of attention, as did lightweight concretes. Modern advances in timber design were described and a valuable paper was presented on new researches into the strength of lightweight, high strength alloys. Two well attended sessions were given over to soil mechanics, a paper by A. W. Skempton presenting new material relating to foundations on compressible clays and suggesting that too much attention had been paid to consolidation and not enough to total settlements.

All the papers were available in printed form in three volumes before the congress began. Discussions and other speeches will appear in a fourth volume now in preparation. A few sets are still available and may be obtained at a cost of $9.80 from the Organizing Secretary, Building Research Congress, 57 Onslow Gardens, South Kensington, London, S. W. 7.

• **Helping Thailand**—The U. S. Bureau of Reclamation began to help Thailand in 1946. To date, 48 Thai irrigation engineers have been given in-service training in the Denver, Colo., office of the bureau's chief engineer, or in other regional offices. Besides that, two design engineers from the bureau are now assigned to the Royal Thai irrigation department on loan through the Economic Cooperation Administration. The bureau is also advising Thailand on the design of its largest dam, on which it is expected construction will start soon

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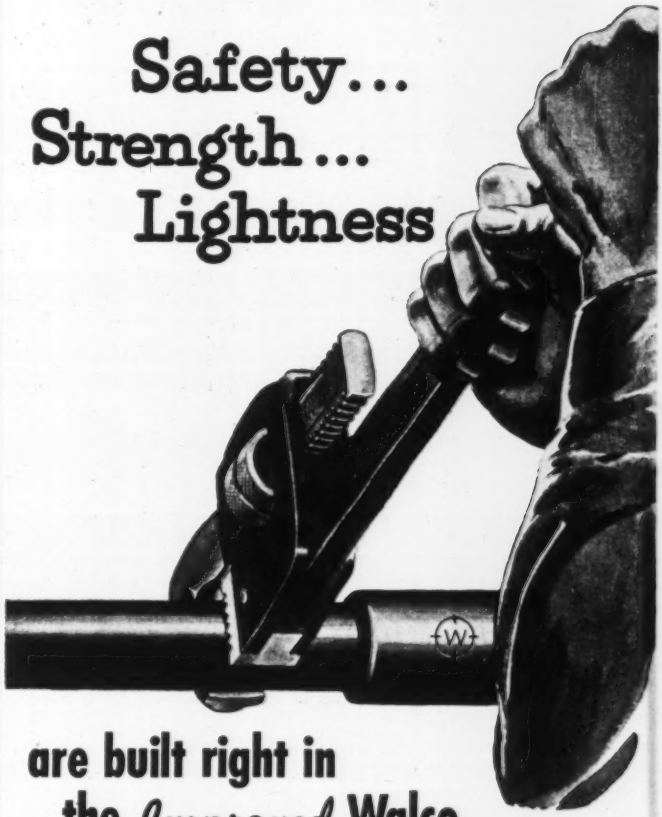

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MUNICIPAL

Seattle, Wash., makes plans for industrial dispersal

The industrial dispersion plan of county and municipal planning commissions and the Chamber of Commerce at Seattle, Wash., recently adopted by the President as a national policy, contemplates the establishment of a number of industrial parks, consisting of areas specifically platted for industry and buffered from surrounding residential areas so as to provide a campus-like setting for light industries.

No plants that cause noise, smoke, odor or vibration would be located there. In addition to the plant sites, the "park" would provide supplies of power and water, as well as rail and highway connections. Research laboratories, employee lunch and meeting rooms, a central delivery and pick-up system, etc., also would be part of a large industrial park layout, points out John L. Nordmark, director of the King County Planning Commission.

Preliminary studies have been made of possible sites, but careful analysis of the collected data still is required. Problems include a shortage of power, inadequate water supply in the area across Lake Washington from Seattle for at least three more years, and centralization of the railroads. The rail problem could be solved by construction of one or two short links connecting the existing secondary lines, creating a complete belt line system of railroads serving the central part of the county, and providing alternate routes for all western train movements.

Master plan highlights Cincinnati's 7 needs

Seven vital and immediate needs indicated by the Master Plan of Cincinnati, Ohio, are:

1. A modern expressway and motorway system, together with off-street parking facilities, to take care of expanding traffic and preserve the value of business districts and neighborhood shopping centers.

2. Better living conditions and wiser land use through slum clearance, urban redevelopment and encouragement of modern building by private enterprise.

3. Expanded hospital facilities and neighborhood health centers.

4. New park and recreation areas.

5. Control of flash floods in the Cincinnati area, elimination of stream pollution and sewage disposal improvement.

6. Improved traffic safety for both cars and pedestrians through modern traffic safety and control methods.

7. Continued modernization of public equipment.

Millions for housing

The advisory committee on housing set up by Mayor Thomas A. Burke of Cleveland is planning to form a million-dollar corporation for construction of low-income housing in blighted or blight-threatened areas. The corporation will be patterned after similar ones in St. Louis, Baltimore, and Toronto. Meanwhile, the site procurement subcommittee of the mayor's group has taken an option to buy an acre of land on E. 55th St. which would provide the site for a 48-suite apartment development. Preliminary plans for the development are being made by Michael Kane and Dennis Blair, who are the architects.

More than $25,000,000 has been invested in new apartment houses and other rental projects in Minneapolis, Minn., and its suburbs since the end of World War II. Eighty-nine projects financed by loans guaranteed by the Federal Housing Administration, have been completed or are under construction in the area, according to Harold Farley, state FHA director.

The first units of the $5,000,000, low-rent public housing project at St. Paul, Minn., were opened recently. This development created by the St. Paul Housing Authority consists of 525 units of row-type, duplex and apartment structures of one to four bedrooms, and is known as the John J. McDonough Homes, after a former mayor. The tract covers 73½ acres. The density is estimated at 12.2 families per acre. This is the first midwestern housing development to be completed under the Housing Act of 1949.

There are plans by the Wilmington, Del., Housing Authority to add 1,000 new dwelling units to low-income housing developments already in use or under development.

The project, designed to coordinate with slum clearance and urban redevelopment plans, would be carried out within the next four years with funds made available under the U.S. Housing Act of 1949.

The Rev. F. Raymond Baker, chairman of the Wilmington Housing Authority, said that the commission voted unanimously to ask the Public Housing Administration for allocation of the 1,000 additional homes to Wilmington.

These would supplement the present developments at Eastlake and Southbridge, built before World War II, and the 380 new units which soon will be constructed to expand those two projects.

The purpose of the request for 1,000 more low-income housing units, Mr. Baker said, is to cooperate with the local governing body and other interested organizations and individuals in successfully ridding the city of its blighted areas over a period of years.

UNUSUAL HOME.—This California-type 5-room house includes a number of unusual features, its builders claim. The building is said to be fire-, termite-, and decay-proof. There are two electrically-operated picture windows in the living room. The one in front, at the touch of a button disappears into the wall and is replaced by a wire screen. The one at the rear drops down into the floor so that one can walk out onto a screened porch. The builders say the flat roof can be flooded to cool the house in the summer, while for the winter there is an unusual heating system with the oil-burning hot air furnace located on the roof. This view shows a model house in the Borough of Queens, N. Y. City. The present price is a little less than $12,000. The architect is Lawrence Vita, 101 Park Ave., New York—Wide World photo.

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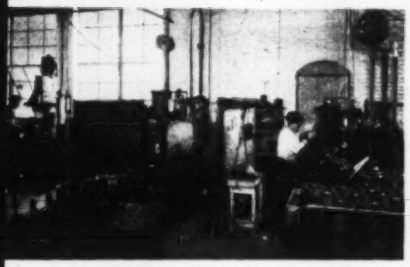

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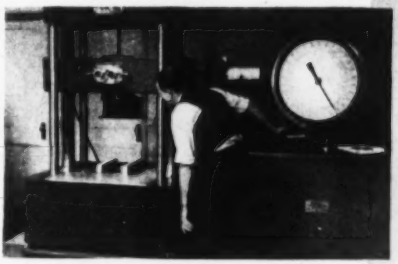

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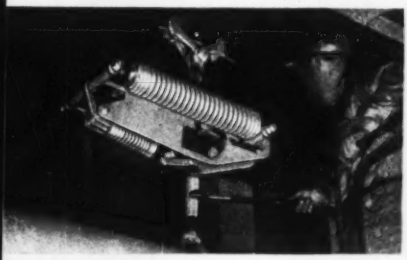
In its modern, well-equipped laboratory, tests are constantly being made to discover better ways of solving old and new pipe suspension problems.



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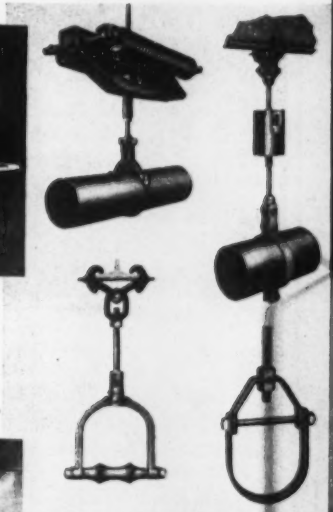
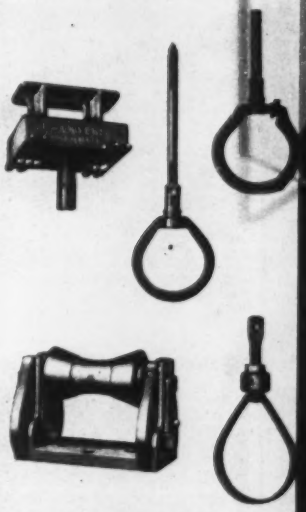
GRINNELL, ALONE, THROUGH ITS CONVENIENT WAREHOUSES CAN SUPPLY YOU "OUT OF STOCK"

No manufacturer of pipe hangers offers a distribution system as thorough or efficient. Grinnell warehouses are located in 30 principal cities . . . with jobbers in practically every city, coast to coast.



Grinnell makes scientifically designed, ruggedly built pipe hangers and supports for every type installation.



Pipe suspension presents an extremely wide range of problems involving weights, stress, thermal movement, materials and specialized engineering. No one "goes into" the pipe hanger business overnight. Large manufacturing facilities, skilled technicians, and a lot of down-to-earth practical experience are needed.

Grinnell has become America's No. 1 supplier of pipe hangers and supports only because Grinnell has specialized in piping for one hundred years. Grinnell has developed a line of pipe hangers and supports for every piping requirement, from the simplest to the most complex.

Grinnell is always ready to co-operate with engineers and architects in the preparation of pipe suspension specifications.

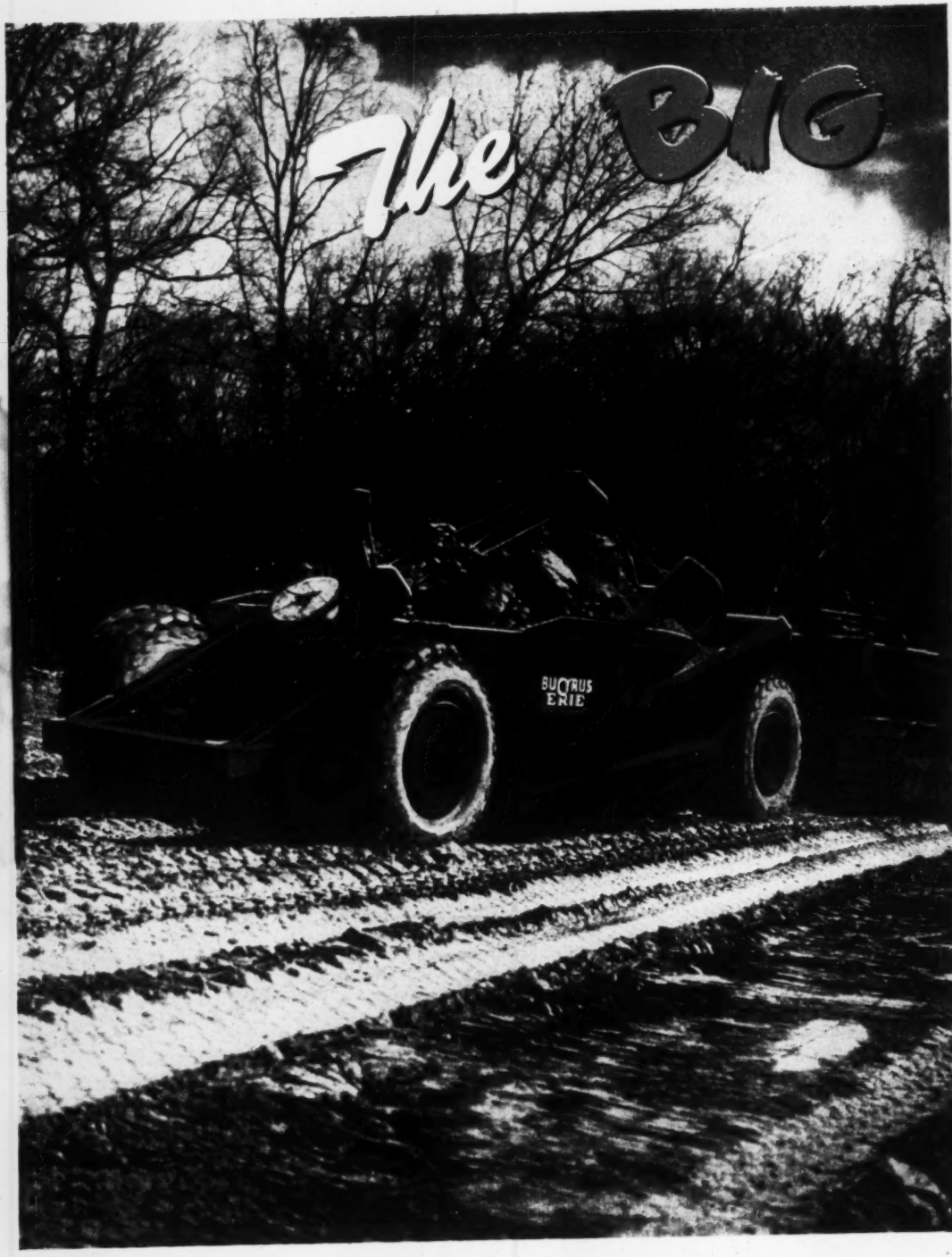
Call Grinnell for any and all types of pipe hangers and supports.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Sales Offices and Warehouses in Principal Cities

pipe and tube fittings • welding fittings • engineered pipe hangers and supports
Thermolier unit heaters • valves • Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies • industrial supplies
Grinnell automatic sprinkler fire protection systems • Amco humidification and cooling systems


The BIG
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RED TEAM

. . . Best at Every Distance on Highway Relocation Job

HANDLING 600,000 yd. of wet sticky clay put every tractor-scraper unit in the contractor's spread to a rugged test on this job. Both loading and unloading were extremely difficult, and hauls ranged from 300 to 2200 feet. Yet the Big Red Team — an International TD-24 and Bucyrus-Erie B-type scraper like the one pictured — outperformed, outproduced every other unit on every count.

Actual on-the-job performance showed that the Big Red Team delivered up to twice as much dirt as any other tractor-scraper combination. Its hourly averages were as high as 173 cu. yd. on the 350-ft. hauls — 118 cu. yd. on the 2000-ft. hauls.

The Bucyrus-Erie scraper is the pay-dirt member of the Big Red Team — perfectly matched to the TD-24 to take full advantage of its great power. Both B-type models, the 15-yd. and the 22-yd. (struck capacities), load quicker, dump faster and cleaner in any kind of material than any other scraper. See for yourself. Ask for a demonstration of the Big Red Team on *your* job as soon as possible.

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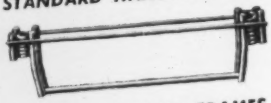
For Dependable Concrete Forming...

USE SUPERIOR CONCRETE ACCESSORIES

SNAP TIES

STANDARD HANGER FRAMES

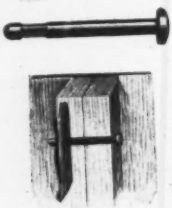
STANDARD COIL TIES



SPECIAL HANGER FRAMES

CONE-FAST COIL TIES

ROD CLAMPS



PANEL LOCK BOLTS

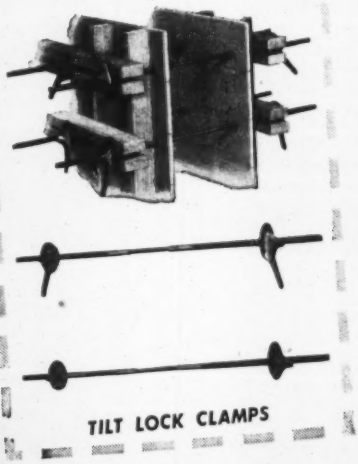
DOVETAIL ANCHORS AND SLOT

ADJUSTABLE SCREED CHAIRS

Here you see several of the many various types of Form Ties, Anchors and other concrete accessories which SUPERIOR'S many years of know-how and dependability have produced to meet rigid job specifications.

Every item in the SUPERIOR line is specifically designed to provide the most efficient forming method for ordinary foundations, engineering structures, watertight walls and architectural concrete.

When you plan form work, Superior's experienced engineers are always available to prepare suggested layouts of form work as well as complete estimates and quotations.



TILT LOCK CLAMPS

SUPERIOR CONCRETE ACCESSORIES, INC.
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Pacific Coast Plant 2100 Williams St., San Leandro, Calif.

Request a copy of our new catalog... it contains a valuable table for spacing studs, wales, and form ties.

MEN AND JOBS

AT AIRPORT GROUNDBREAKING—Pleased officials take a ride at groundbreaking for the $6,700,000 terminal building at San Francisco International Airport. The ceremony marked the start of construction on the project authorized by a bond issue voted in 1949. Clinton Construction Co. of San Francisco has the contract. Left to right, Victor S. Swanson, member, San Francisco Public Utilities Commission; Henry Eickhoff, Jr., chairman, aviation committee, S. F. Chamber of Commerce; James H. Turner, manager of utilities, S. F. PUC; Philip F. Landis, president, S. F. PUC. Six-story building is to be in a "V" formed by two sets of dual runways. It will serve 13 airlines and will contain district headquarters of U. S. Weather Bureau, CAA Control tower and offices, the Overseas Foreign Air Communications Services, and passenger conveniences.

TO FAR EAST COMMAND—Col. Ellsworth I. Davis, district engineer of the Galveston District for the last two years, has been assigned to the Far East Command, Yokahoma, Japan. He went to Galveston in 1949, after having been assistant district engineer at Sacramento, Calif. He entered the Corps of Engineers upon graduation from the U. S. Military Academy in 1932, and he received his master's degree in engineering from M.I.T. During World War II, he commanded an Engineer Combat Group in Europe and was awarded the Legion of Merit. In 1946-1948 he was engaged in an extensive investigation to determine means of increasing the capacity and security of the Panama Canal. At Galveston he directed a large program of rehabilitation and new construction at Army and Air Force installations in Texas and Louisiana.

Are Today's Plans Adequate for Tomorrow's Needs ?

The independent consulting engineering organization is Management's most helpful ally in working out modernization programs, new plant designs, expansions, and related projects.

Management's utilization of the skill and know-how of technically trained experts in architectural, civil, chemical, electrical, and mechanical engineering clearly indicates the trend in progressive thinking in relation to present and future problems.

The Peter F. Loftus Corporation through the years has cooperated with the management and engineering staffs of many utilities, industrials, institutions, and governmental agencies.

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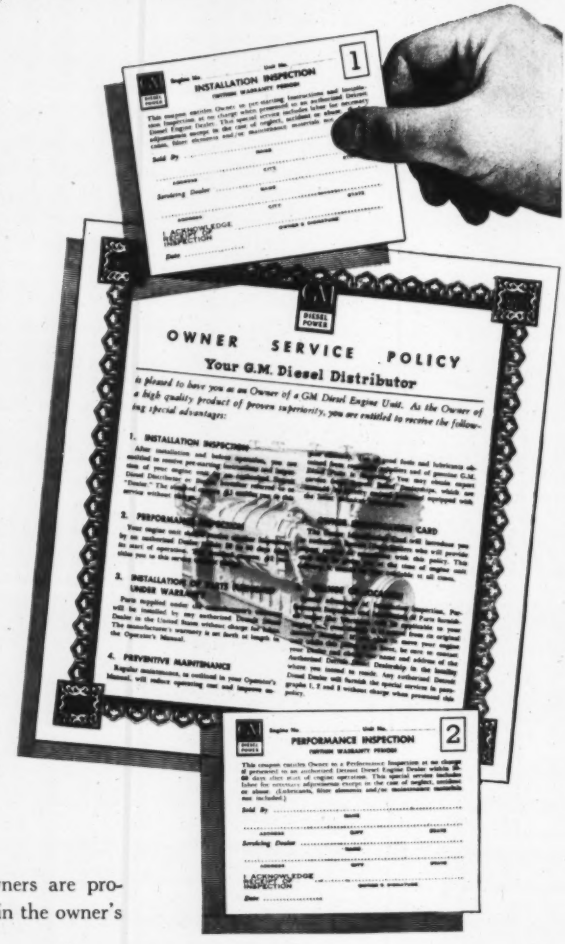
Established 1930
ENGINEERING CONSULTANTS

First National Bank Building,
Pittsburgh 22, Pennsylvania

Back of Your New GM Diesel Power

3 BIG SERVICE EXTRAS



We want every purchaser or prospective purchaser of one of our engines to know how his local GM Distributor and Dealer, with their factory-trained servicemen, stand back of the product. They in turn are backed by the knowledge that Detroit Diesel supports them strongly in their adherence to this policy.

1. *Installation Inspection:*

The GM Diesel serviceman inspects and checks the engine without cost to the owner; whenever possible this is done before the engine is put to work. He explains how to successfully operate the engine and the "preventive maintenance" necessary for best results in days to come.

2. *Performance Inspection:*

From thirty to sixty days after the engine has begun its job, another inspection is provided without charge. The GM Diesel serviceman makes any adjustments that may be required and tunes up the engine to its best performance.

3. *Owner's Service Policy:*

Besides the above inspections, GM Diesel owners are protected by the exceptional warranty mentioned in the owner's service policy.

ANSWER THE CALL CIVIL DEFENSE

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... Up to 275 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS... Up to 800 H.P.

GENERAL MOTORS

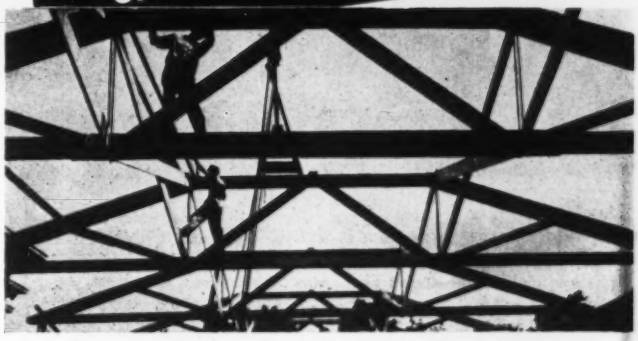
GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

RETIRING—Bernhard F. Jakobsen, retiring after 20 years of government service as a civil engineer, is congratulated on his achievements by Col. D. S. Burns, division engineer, South Pacific Division, U.S.A. Jakobsen has served as a design engineer and expert consultant on many dam and power projects. Twice awarded the Norman Medal of the American Society of Civil Engineers, he was in 1948 a member of the United States delegation to the International Congress on Large Dams and the International Conference on Soil Mechanics and Foundation Engineering.

ASSISTANT DISTRICT ENGINEER—Lt. Col. Robert W. Lockridge is assistant district engineer for the Nashville district, Corps of Engineers. He is a University of Maryland C.E. graduate, and entered the Organized Reserve Corps in 1931. He was assigned to active duty at Fort Meade, Md., in 1935. He served as area engineer at the Ravenna Ordnance Plant, the Portage Ordnance Depot, the Scioto Ordnance Plant in Ohio, and at the Marion Engineer Depot, Ohio. During 1943 and 1944 he was district engineer at the Edmonton Engineer District, Edmonton, Alta. In 1948 he was assigned to the Far Eastern Command as chief of Construction Engineer Section, Headquarters 5th Air Force, where he supervised the construction of all Fifth Air Force airfields in Japan, and was commander of the 930th Aviation Engineer Group.

TIMBER TRUSSES *Save* UP TO 50% MATERIAL



Lank-Teco timber trusses effect a saving of up to 50% in lumber—*plus* an equal saving in hardware and labor required for fabrication! Illustrated is a typical Lank-Teco design, a 48′ span.

HERE'S WHY Lank-Teco saves material. The design incorporates the lapped type of chord splice, and reduces the number of members to a minimum—thus markedly reducing truss deflection under load.

TEST PROOF of Lank-Teco superiority: under test, a 50′ Lank-Teco truss span was loaded to full design load of about 25,000 lbs., for 7 months, which was double the designed for time loading. Despite the long loading period, results were: deflection only ½ that of similar span flat-top trusses also tested. The Lank-Teco truss was overloaded to failure after 7 months and carried almost 2½ times design load before failure.

Leading architects and engineers everywhere specify TECO timber connectors for light and heavy frame timber construction.

Specify timber—there's plenty of it for early delivery.

TIMBER ENGINEERING COMPANY, 1319 - 18th St., N.W., Washington 6, D. C.

Please send FREE copy of Lank-Teco Truss bulletin and "Modern Timber Roof Trusses."

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Terrific Value...
IN EVERY CHANNEL OF OPERATION!

This dependable high-speed excavator "steals the show". You will find it is capable of delivering more work hours at less cost than any similar machine on the market. The UNIT 1020 is carefully engineered for the really tough jobs, with drop forged alloy steel gears and shafts completely enclosed and oil sealed in Unit's exclusive, one-piece gear case. Fewer parts mean less replacements, cut operating and maintenance costs to a minimum. And the modern FULL VISION CAB offers 360° visibility. Keeps both man and machine at top efficiency. Available in gas or Diesel type. Convertible to all attachments. Write for Catalog L-400.

Select
Your Favorite UNIT Star

- ★ UNIT 357 Mobile Type ½ Yard Excavator Crane up to 9 tons.
- ★ UNIT 614 Crawler Type ½ Yard Excavator Crane up to 8 tons.
- ★ UNIT 1020 Crawler Type ¾ Yard Excavator Crane up to 10 tons.
- ★ UNIT 1520 Mobile Type ¾ Yard Excavator Crane up to 20 tons.
- ★ UNIT 1014 Truck Crane ½ Yard Excavator Crane up to 12 tons.
- ★ UNIT 1520T Truck Crane ¾ Yard Excavator Crane up to 20 tons.

All Models Convertible to ALL Attachments.

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OBITUARY

Louis B. Puffer, 65, professor of civil engineering at the University of Vermont, died Oct. 11 in Burlington. He was graduated from Rensselaer Polytechnic Institute in 1909, and went to the University of Vermont in 1921 as assistant professor. He was made a full professor in 1933.

James A. Milne, 59, president of the J. A. Milne Sanitary Engineering Co., and chairman of the Massachusetts Board of Plumbing Examiners, died Oct. 8, in Pittsfield. During World War II he lectured on sanitary matters before student nurses in numerous hospitals. He was awarded a citation by the United States Public Health Service.

Herbert Ladue Woolhiser, 65, village manager of Winnetka, Ill., for 34 years, died Oct. 7. He was past president of the International City Managers' Association and a member of the Western Society of Engineers. He was graduated from Whitewater, Wis., State College and the University of Wisconsin school of engineering.

G. Woodford Thomas, 62, an inspector in the Youngstown, Ohio, city engineering department, died Oct. 9. He was a graduate of Ohio State University.

John M. Barringer, 73, died in St. Petersburg, Fla., Sept. 28. He was city manager of Flint, Mich, from 1932 to 1937, and served as director of war surplus property disposal in Hawaii, Alaska, Aleutian Islands, Puerto Rico and Virgin Islands from the end of World War II until 1947. He was an engineering graduate of Ohio State University in 1901.

Raymond F. Crump, 62, consulting engineer for the Peter F. Loftus Corp., Pittsburgh, died Oct. 13. He was a graduate of Lehigh University.

Estill R. Moore, for 22 years building engineer for Emery Kinkhead, Inc., died at Louisville, Ky., Oct. 8.

Frank E. Dow, 62, a construction engineer, and 1911 graduate of M.I.T., died at Framingham, Mass., Oct. 17. One of his most important assignments was superintendent of construction for the General Motors Bldg. in Detroit.

Allen E. Wright, 74, a civil engineer employed both by the federal government and the city of Detroit, died Oct. 11, at Detroit. He was a gradu-

ate of the University of Wisconsin. He joined the U. S. Engineers and became a pioneer on river and harbor improvements on the Great Lakes.

C. R. Hawley, 72, construction engineer, died at Richmond, Va., Oct. 14. He was a graduate of the L. C. Smith College of Applied Science, Syracuse University. For some time he was resident engineer for the Virginian Railway.

B. C. Bugbee, 72, consulting engineer, died at Waukesha, Wis., Oct. 7.

Edmond V. Ragland, 60, secretary-treasurer of the Superior Stone Co., died at Raleigh, N. C., Oct. 14.

B. F. Walther, former city engineer of Farmington, Mo., was killed in an automobile accident at Rogersville, Mo., Oct. 7. He was a member of Walker & Vandegrift, consulting engineers.

States help cities on street repairs

Legislatures of five states passed highway aid bills this year to help cities finance the repair of thousands of miles of streets, the American Municipal Association, Chicago, has reported.

North Carolina will assume full responsibility for the maintenance of all highway system streets as well as streets serving as links between highways within the cities. An estimated $4,500,000 of the state gas tax revenue is to be allocated to the cities for use on non-highway streets.

In Illinois, the one-cent gasoline tax increase, effective last month, will raise the cities' share from this source 25 percent. There will be an additional one-cent boost in 1953.

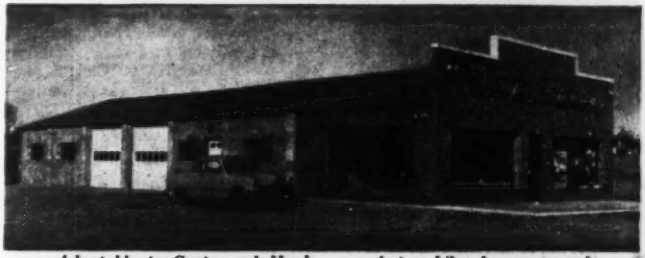
Under a new law in Kansas, cities will receive 20 percent of gas tax collections over the $4,500,000 regularly apportioned to the counties and cities. This year more than $800,000 in excess collections are anticipated.

In Wyoming, counties will get 75 percent and cities and towns 25 percent of the additional penny gas tax approved this year.

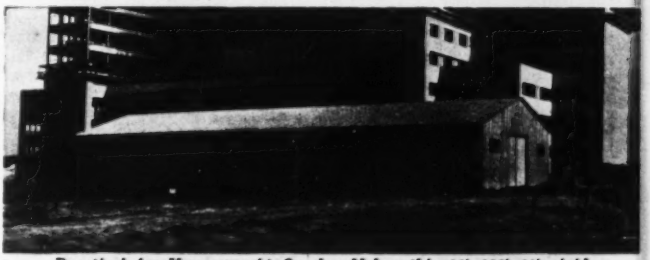
Pennsylvania allocated $12,000,000 in gas tax funds to municipalities, to be distributed 60 percent on mileage and 40 percent on a population basis. An additional $3,000,000 was made available for matching grants to cities for road improvement.

A constitutional amendment is to be submitted to Minnesota voters for the sharing of state motor vehicle tax revenue with local governments. Counties would get 25 percent of the gas tax proceeds and cities 10 percent.

Contractors— Build Faster...Profit Sooner with BUTLER BUILDINGS



Adaptable to Customers' Needs . . . Automobile showroom and shop at Ames, Iowa, shows how Butler Buildings meet special requirements. Here sturdy Butler structurals and aluminum, insulated roof are combined with masonry sidewalls. Note large display windows.



Practical for You . . . At Omaha, Nebr., this 40'x120'x14' rigid frame Butler Building is used as contractor's warehouse. Butler Buildings also make permanent yet portable job site shelters, field offices.

Less building time with Butler Buildings means greater satisfaction for your customers . . . quicker profits for you. Butler Buildings are ready for use *faster* . . . earning you your fair profit from the job *sooner*. And Butler Buildings are fire-safe, weathertight, easily insulated at low cost. Available in a wide range of sizes.

Start now to save and profit with Butler Buildings for yourself and your customers . . . see your friendly, helpful Butler distributor, or mail coupon today.

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SAVE UP TO 50% ON BATTERY COSTS

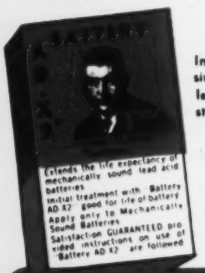
BATTERY AD-X2*

Frank I. Guilford, manager California Tractor & Equipment Corp., Oakland, Calif., writes:

"In 1947 we obtained some War Surplus Euclids. They had been stored in the Tropics and we found the batteries could not be normally charged even though they had never been used. We bought 108 packages of Battery AD-X2, treating the batteries as per directions, and charged them. These batteries came to full charge after treatment.

"After this experience we adopted your Battery AD-X2 Service System, treating all our mechanically sound batteries and sending our junks in for re-processing. Your method of handling our battery problems has saved up to 50% on our battery costs over the past 3½ years. It has also resulted in reducing downtime on our rented equipment. Your full money-back guarantee is appreciated by us after many years of controversy over battery adjustments on a standard warranty basis."

Start saving NOW with Battery AD-X2. Group 1 and 2 battery treatment, $3 . . . or use our Re-Processed Batteries. Money-back guarantee. Write or phone TODAY for prices, fleet discounts and address of nearest distributor.


Extends the life expectancy of mechanically sound lead acid batteries
Initial treatment with Battery AD-X2 good for life of battery
Apply only to Mechanically Sound Batteries
Satisfaction GUARANTEED provided instructions on use of Battery AD-X2 are followed

In use continuously since 1947, keeping lead acid batteries stronger longer.

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Still some territories, State and local, open to qualified operators. 10

MEETINGS

C. Arthur Elliott, president of the Iowa County Engineers Association, has named a committee of county engineers to join the Iowa Good Roads Association in a study of the Iowa secondary road situation for presentation to the 1953 legislature. The committee: J. F. Arthurs Jr., Marshalltown; C. P. Rudisill, Hampton; L. W. Casey, Cherokee; Paul J. Mahoney, Council Bluffs; L. E. Clayton, Fairfield and C. W. Baldwin, Waterloo.

Carroll L. Mann, Jr., of Greensboro, was elected president of the North Carolina Section of the American Society of Civil Engineers, succeeding J. Norman Pease of Charlotte. Other officers named: P. D. Davis of Durham first vice-president; E. B. Rice of Raleigh, second vice-president; and R. E. Fadum, head of the Civil Engineering Department, North Carolina State College, Raleigh, secretary-treasurer.

Thomas E. Arp, president and treasurer of the Sherman Concrete Pipe Co., Knoxville, Tenn., has been elected president of the Southeastern Concrete Pipe Association. He succeeds Henry O. Strohecker, Jr., of Charlotte, N. C. Harry Easterly, Richmond, Va., was elected vice-president; John Harris, Tallahassee, Fla., secretary; and L. D. Weaver, Flomaton, Ala., treasurer.

The annual meeting of the Tennessee Valley Section, A.S.C.E. will be in Knoxville, on Nov. 16 and 17. The technical sessions will have a discussion of steam plant design by the mechanical design staff of the Tennessee Valley Authority, now engaged in the expansion of steam plant facilities; and an inspection trip through the John Sevier classification yard of the Southern Railway in Knoxville.

Improvement of the status of professional engineers and encouraging young engineers to remain in the profession received the attention of delegates to the fall meeting of the New York Society of Professional Engineers in Utica. About 100 members attended. The group went on record in favor of a proposed amendment to cut the cost of financing the State Thruway.

C. A. Dillon of Raleigh, has been re-elected president of the North Carolina Engineering Foundation. Other officers: Henry A. Foscue of High Point, vice-president, succeeding John W. Clark of Franklinville, Lexie Ray of Raleigh, re-elected secretary; and J. G. Vann of Raleigh, treasurer. The principal objective of the foundation is to provide financial supplements to the state salary scale in attracting eminent teachers and scientists for engineering teaching and research at N. C. State College in Raleigh. Directors elected: Nello L. Teer Jr., and John B. Wilson of Durham; Paul S. Barnes and John C. Whitaker, of Winston-Salem; R. J. Barnes and J. Laurens Wright of Charlotte; Charles K. Bryant, Elbert F. Lewis, and A. F. Marus of Greensboro; Charles K. G. Bryant of Gastonia; Gaylord David Davis of Enka; Trent Ragland, W. D. Martin, and J. W. York of Raleigh; L. E. Solomon of Newport News, Va.; Leslie Taylor of West Palm Beach, Fla., and M. Sam Hayworth of Rocky Mount.

David B. Steinman, bridge designer, was the principal speaker before more than 400 consulting engineers and engineering students at Northeastern University in Boston, Oct. 17. His subject was "Romance of Bridges." Northeastern University's student Civil Engineering Society with the American Society of Civil Engineers, Northeast Section, and the Boston Society of Civil Engineers, were sponsors. Colleges represented were: University of Connecticut, Dartmouth, Harvard, University of Maine, University of Massachusetts, Northeastern University, Norwich University, M.I.T., Rhode Island State, Tufts College, University of New Hampshire, Worcester Polytechnic Institute, University of Vermont, and Yale.

CALENDAR

Conference on Coastal Engineering, Rice Hotel, Houston, Tex., Nov. 7-10.

National Conference on Industrial Hydraulics, Sherman Hotel, Chicago, Nov. 8-9.

Tennessee Valley section American Society of Civil Engineers, annual meeting, Knoxville, Nov. 16-17.

Conference on Atomic Installation in Buildings, Building Research Advisory Board, National Academy of Science auditorium, Washington, D. C. Nov. 27-28.

Southeastern Association of State Highway Officials, annual meeting, Charleston, S. C., Dec. 6-7.

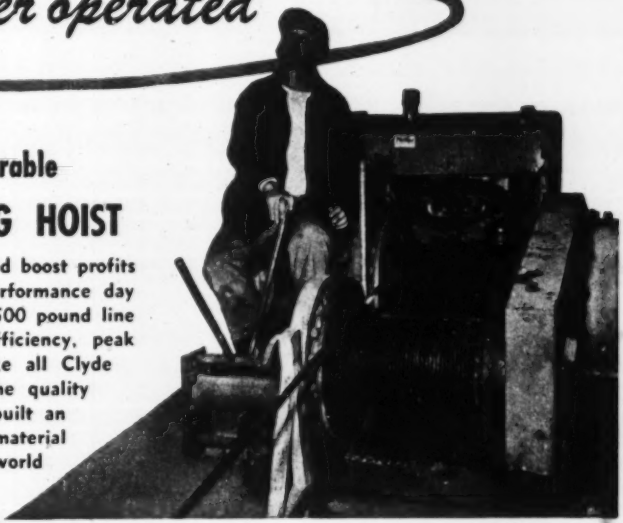
Bituminous Concrete Producers Association, annual convention, The Roosevelt Hotel, New York City, Dec. 6.

Highway Research Board, annual meeting, National Academy of Sciences Bldg., Washington, D. C., Jan. 15-18.

Canadian Construction Association, annual meeting, Royal York Hotel, Toronto, Ont., Jan. 20-23.

American Road Builders Association, Golden Anniversary, Rice Hotel, Houston, Tex., Jan. 21-24.

"...this is the finest hoist I ever operated"

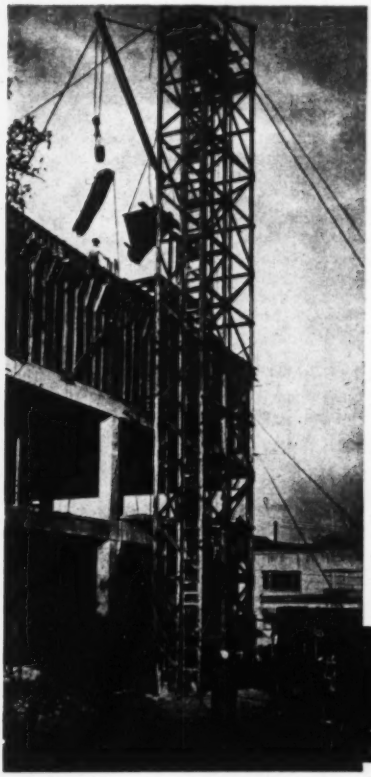


It's another dependable, durable

CLYDE BALL BEARING HOIST

A Clyde hoist will cut job costs and boost profits by delivering smooth, powerful performance day after day—job after job. Clyde 5,500 pound line pull hoists combine maximum efficiency, peak power and long service life. Like all Clyde equipment, this model provides the quality design and construction that has built an outstanding reputation for Clyde material handling equipment all over the world

This is the Clyde hoist that prompted the operator to call it "the finest I've ever operated." Shown in use on a store and office building job in Washington, D. C.



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When you combine these important advantages in a modern hoist design you're bound to get easier operation . . . dependable, low-cost performance. All steel, electrically welded frame and side stands for strength and rigidity. Light weight for portability. Thrust is full ball bearing screw and yoke type, easy to engage and with perfect load control. Friction is a durable, single cone with asbestos lining. Controls banked to operator's easy reach.

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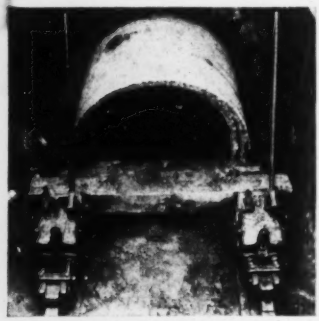

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EDUCATION, RESEARCH

More training programs for engineers to be started by development council

Although the Engineers Council for Professional Development has not received the financial support it had hoped to get for its program of post-college training for young engineers, it is planning to start setting up such a program in one or more cities next year as a demonstration of the possibilities of the proposal.

That decision was announced by H. S. Rogers, chairman of ECPD, at its annual meeting in Boston, Oct. 19-20. The council also plans to expand its student guidance work as a means for increasing the number of young men seeking training as engineers.

• **Funds for training**—Contributions to start the training program, up to Sept. 30, total $8,900. Renewal of a special grant of $5,000 from the Engineering Foundation also is expected, and at the meeting it was announced by Mr. Rogers that some additional gifts had been promised.

Last year, when ECPD announced the program (ENR Nov. 2, p. 26) it was hoped that $100,000 could be raised so that $20,000 would be available during each of the following five years to pay for a full-time director and clerical help.

It is probable that the program will be started in a city where there are college facilities that can be used and where industries have gained some experience in organizing such training programs for their employees.

Speaking of the special problems of civil engineers—due to the fact that few of their young men are concentrated in a single industry or office—H. P. Hammond, former engineering dean of Penn State, said that Penn State had organized such training courses in cities far removed from the college and had succeeded in getting consulting engineers to give time to teaching classes not in their own city.

Along the same line, L. F. Grant, field secretary of the Engineering Institute of Canada, told of how he had succeeded in starting training groups in cities that had no university facilities, such as Niagara Falls, Ont.

• **More guidance work**—Willis F. Thompson, chairman of the Guidance Committee, said that during the past year the groundwork has been laid for much more effective counseling of students in secondary schools who are interested in engineering. Regional chairmen have been appointed for the eight regions into which the country has been divided in a plan to decentralize activities as much as possible. The plan is to supplement the activities of guidance groups already set up by the state societies of professional engineers and local sections of the engineering societies. New groups will be organized only where none exist.

• **Accrediting expanded**—Engineering courses at nine schools not heretofore examined by regional committees of the Education Committee were reviewed during the past year. In all, 60 curricula were examined; 37 were new, 23 were re-examinations.

At the Boston meeting the council extended the provisional accrediting to many courses in a large number of schools for one year to permit those schools to bring the courses up to ECPD standards.

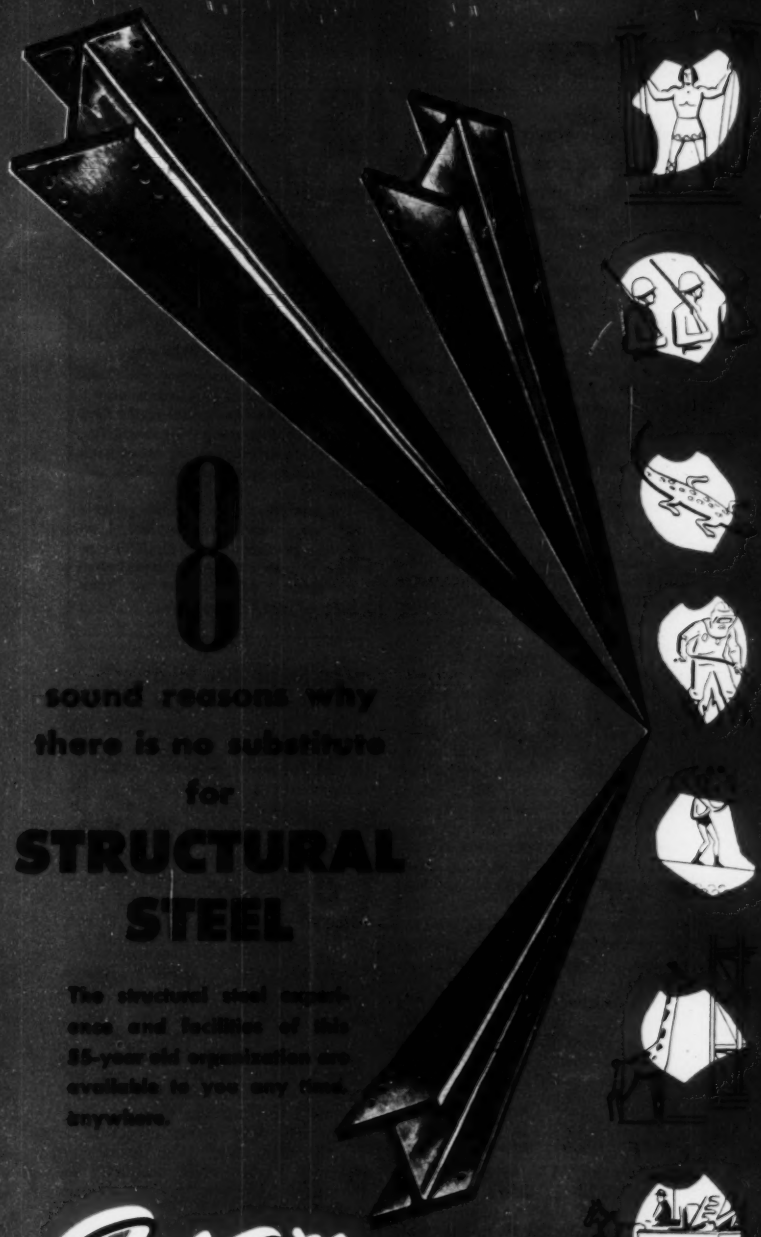
• **Adequacy of engineering courses**—S. C. Hollister, chairman of the Education Committee, also presented the report of a special committee on the adequacy and standards of engineering curricula. Concerning standards, Dean Hollister said there is no generally accepted professional objective for the education program of the nation's engineering schools. There is general agreement as to the form of curricula, but as between schools, there is a vast difference in the "depth of instruction," in objectives and professional approach.

Some schools, Dean Hollister said, concentrate on developing in students a power of analysis and resolution in engineering situations that permit a wide range of application, while others make the applied courses the goal, with a minimum of application of the sciences.

• **New Officers**—Harry S. Rogers, president of the Polytechnic Institute of Brooklyn, was reelected chairman of ECPD and L. F. Grant was continued as vice-chairman.

Thorndike Saville, dean of the college of engineering at New York University, succeeds S. C. Hollister as chairman of the Education Committee, and Bernhardt G. Skrotzki, associate editor of POWER, is the new chairman of the Guidance Committee.

Albert S. Fry, chief of the hydraulic data branch of the Tennessee Valley Authority, succeeds Frank C. Tolles, consulting engineer, Cleveland, as one of the three ASCE representatives on ECPD.



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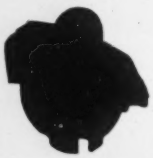

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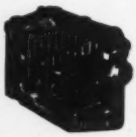

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LABOR

Start wage parleys for Alaska army work

With what military leaders characterized as the biggest Alaskan winter construction program in history scheduled, negotiations to cover construction labor rates for the 1952-53 season are already under way.

Little work is normally possible during the severe Alaskan winter, excepting that which can be carried on under cover. Seasonal workers have already started an exodus from Fairbanks, causing a critical labor shortage in that area. However, according to Col. L. E. Seeman, Alaska district engineer, much military construction is slated to be carried on throughout the coming winter, and 79 other projects are scheduled to begin early in 1952.

At present, basic wage rates include: Carpenters, $3.14 an hour; electricians, $3.50; plumbers, $3.50; painters, $3.15; bulldozer operators, $3.22; shovel operators, $3.57; laborers, $2.73; roofers, $3.25; dump truck and flatbed truck drivers, $2.87.

Commenting on the matter of labor union jurisdictions in Alaska, Col. Seeman pointed out that some of the unions have established locals in the territory, others are controlled by Seattle locals, still others deal directly through international organizations. Operating engineers, for example, have branch locals (from Seattle) at Anchorage and Fairbanks; iron workers and sheet metal unions have offices at Anchorage.

Bricklayers, boilermakers appoint job stewards; carpenters, painters, laborers and others have local autonomy.

An Associated General Contractors' chapter at Anchorage and the National Electrical Contractors Association, plus some local employers' groups, have been representing employers in negotiations.

Union pickets union

Because an AFL carpenters union in Pontiac, Mich., didn't take kindly to the use of non-union labor for a roofing job, the union last week picketed—of all places—the Pontiac-Oakland Federation of Labor Temple for one day.

Two pickets representing Building Tradesmen and Carpenters local 998, of Berkley, paraded in front of the labor temple all day, while unaffiliated workers put a new roof on the structure. When the job was over—at 5 p.m.—the pickets and the workers withdrew.

A federation leader said that the non-union workers were hired by a roofing contractor, who had previously promised that union labor would be used on the job.

No union shop contract before work starts

The measure amending the Taft-Hartley law passed by Congress after a bitter fight two weeks ago (ENR Oct. 18, p. 80) does not permit the signing of a union-shop agreement before work has started, as reported in these columns.

A provision that would make possible such an agreement is contained, however, in another measure (S 1973) now referred to the staff of the Senate Labor-Management subcommittee for "clarification."

WSB steps into fight over Hanford wages

The Wage Stabilization Board last week accepted its first case under its limited disputes function, when it stepped into a controversy between a construction contractor and his workers at the Hanford, Wash., atomic energy site.

Spokesmen for 11 construction unions involved, and for the contractor—Guy F. Atkinson Co. and J. A. Jones Construction Co.—have agreed to be bound by the decision of the Board.

The dispute involves the amount of "isolation pay" construction workers should receive. Under a three-year-old agreement, workers living on the construction site at Hanford receive an extra $1.50 a day because they are isolated within a barricaded area. Employees living outside the area, but assigned to work within it, get $2 a day "isolation pay." The unions are demanding that these amounts be boosted by $1, contractors have offered 25 cents.

WSB said it will make the final decisions, but said it would refer the dispute to its Construction Industry Stabilization Committee for hearings and recommendations.

Labor observers thought this method of handling might become standard for settling construction labor disputes occurring in atomic energy work.

Labor briefs . . .

• **End Toledo paint strike**—A five-day strike of painters in Toledo, Ohio, ended when union members accepted an agreement they would only characterize as "mutually acceptable." A major strike issue, however, was the union's demand for time and half pay for second and third shift work, instead of a 25-cent hourly premium. One other term of the new agreement was reported: Union and contractors agreed to petition WSB for approval of a five percent increase, as of Oct. 12, over rates of $2.36½ for brush work and $2.66½ an hour for spray and roller work.

• **Raise for technicians**—Members of the Technical Engineers & Architects Association, AFL, employed by Atkinson-Jones Construction Co. at the AEC's Hanford, Wash., works, have received a $5 raise, retroactive to Sept. 22, and automatic increases three, six and 12 months later—the increases to vary with job classifications.

• **Indiana raises pay**—To meet outside competition for labor, the Indiana Highway Department has agreed to a 10-cent an hour pay boost for its 2,500 hourly employees, including foremen, patrolmen, laborers, machine operators and mechanics. This group did not come under the $15 cost-of-living increase granted to all other employees last July 1.

• **Resume hospital work**—Construction work at Brooks Memorial Hospital, at Dunkirk, N. Y., was under way again, after a two-month shutdown over a jurisdictional labor dispute. Construction of addition to the building was halted August 15, when non-union plumbers were put to work by a contractor. Pickets set up lines which other tradesmen refused to cross, and except for plumbing work, work came to a standstill. A new agreement calls for employment of union plumbers to finish the job.

• **Raise leaders' pay**—Salary increases amounting to $18,000 a year apiece have been voted to Joseph V. Moreschi, president, and Peter Fosco, recently-named secretary-treasurer, of the Hod Carriers, Building and Construction Laborers International Union (AFL) in recent convention at Chicago.

• **Hold down strikes**—In an attempt to end jurisdictional strikes, the Louisville, Ky., Building and Construction Trades Council asked members to submit disputes for mediation, continue work during mediation efforts.

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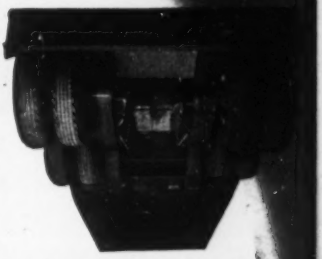

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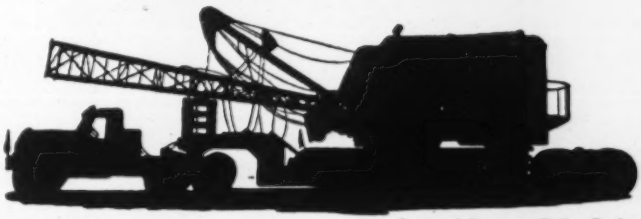

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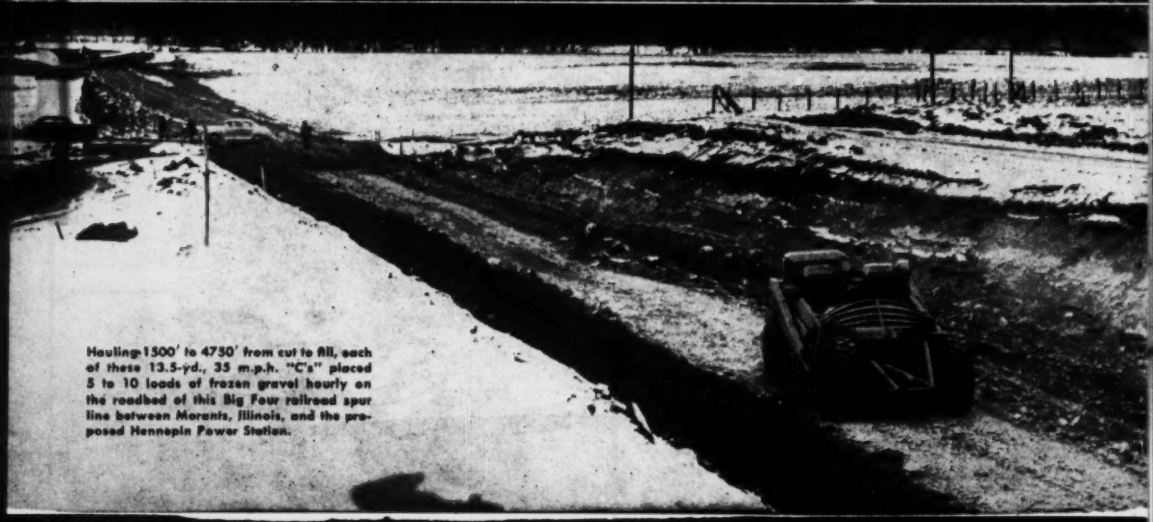
At fill, Tournapull spread its load in 13 to 20 seconds. Patented power-proportioning differential and big 21.00 x 25 low-pressure tires assure plenty of traction in soft, loose gravel.



Hauling 1500' to 4750' from cut to fill, each of these 13.5-yd., 35 m.p.h. "C's" placed 5 to 10 loads of frozen gravel hourly on the roadbed of this Big Four railroad spur line between Morants, Illinois, and the proposed Hennepin Power Station.

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winter shut-down

with electric-control C TOURNAPULLS

Unseasonably cold weather last November presented S. J. Groves & Sons Company with a serious problem on construction of a 200,000 cu. yd., 1.9-mile railroad siding near Hennepin, Illinois. This prominent Minneapolis, Minnesota, contractor had 6 veteran Super C Tournapulls and 2 tractor-drawn W Carryalls on the job . . . but, as material began freezing and snow falling, it became evident that these 8 rigs couldn't possibly finish moving all the dirt, on schedule, before mid-winter shut-down.

Rather than carry the work over, Groves decided to speed production with 4 new, electric-control Roadster-type C Tournapulls. The rigs were driven 70 miles from a completed highway contract at Erie, Illinois . . . put to work on ditching . . . and, despite continuous below-freezing weather, helped finish the work within a month . . . just beating January's sub-zero temperatures.

"C's" make 10 trips hourly on 3300′ cycles . . . 5 trips on 9500′ cycles

On 3300′ round trip, the 4 Roadsters delivered frozen dirt, gravel and boulders at the combined rate of 40 loads per 50-minute hour. With pusher, each 13.5-yd. "C" picked up a load in about 1 minute . . . hauled 1500′ to fill in 1 min. 50 sec. . . . spread in 16 seconds . . . and highballed 1800′ back to cut in another 1 min. 54 sec. Total time for this 3300′ cycle averaged 5 minutes per Tournapull. Total round-trip time for longer 9500′ cycles averaged 10 min. 40 sec. . . . with a combined output of 20 loads per 50-minute hour on this long haul.

"Roadsters top Super C's," says Supt.

"These C Roadsters were *very* satisfactory on both our long *and* short hauls," reports Job Supt. Chester Farrell . . . "far better than the old Super C . . . and I always thought the Super C's were good!"

Have 22 new LeTourneau rigs

In addition to their 4 C Roadsters in Illinois, Groves has 8 more Roadsters and a rubber-tired Tournadozer on New Jersey Turnpike construction at Swedesboro . . . 6 "C's", 2 D Roadster Tournapulls, and another Tournadozer on other jobs . . . making a total of 22 new-line LeTourneau machines in their equipment fleet.

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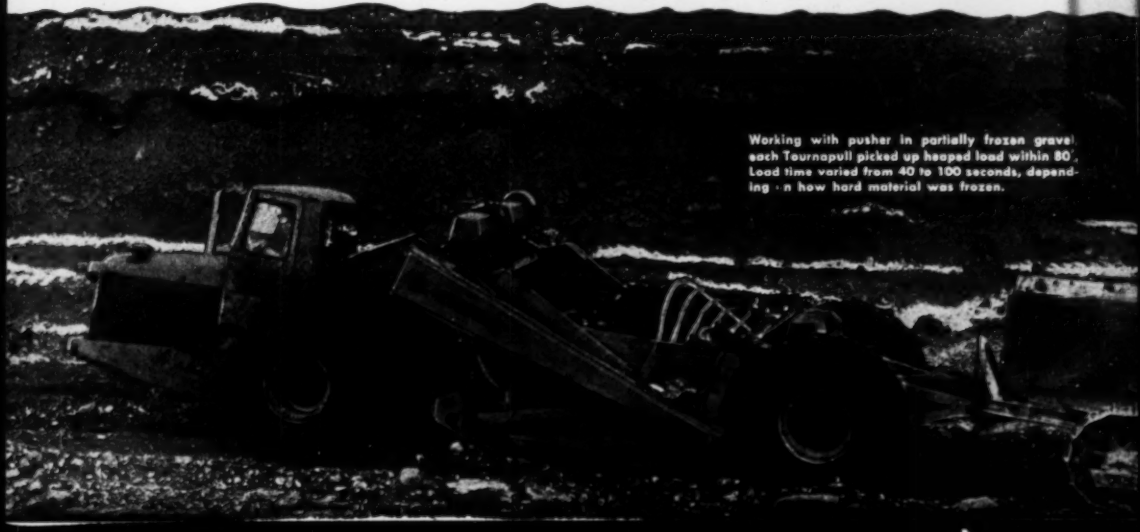
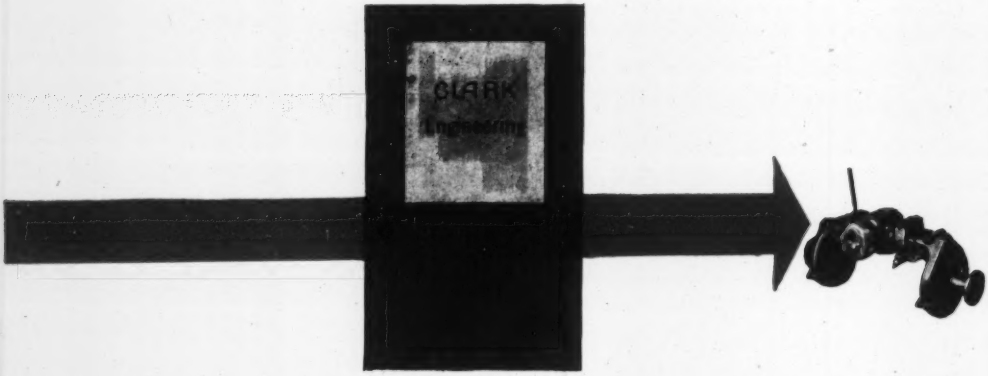


Working with pusher in partially frozen gravel each Tournapull picked up heaped load within 80′. Load time varied from 40 to 100 seconds, depending on how hard material was frozen.

TOURNADOZERS* TOURNAPULLS* TOURNAHOPPERS** TOURNAROCKERS** TOURNACRANES*



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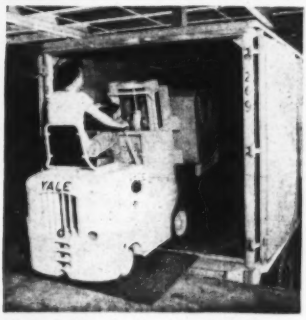
NEW PRODUCTS

Mixer is electric-driven, rides on rails

The group of men standing around the REX 3½S above are representatives of Jamison Coal and Coke Company, and their distributor, The West Virginia Mine Supply Company, both of Farmington, West Virginia. Together they rigged up the Train Mixer by relieving the machine of its axle mounting and replacing it with 42-in. gage mine car wheels. A 1½ hp, 250-volt DC motor furnishes power for the mixer which is moved by a two-way mine locomotive. Jamison says it's fine for air-passage construction as well as patchwork and general mortar and cement mixing. CHAIN BELT COMPANY, 1600 W. BRUCE STREET, MILWAUKEE 4, WISCONSIN.



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New transformer welder

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(Continued on page 92)

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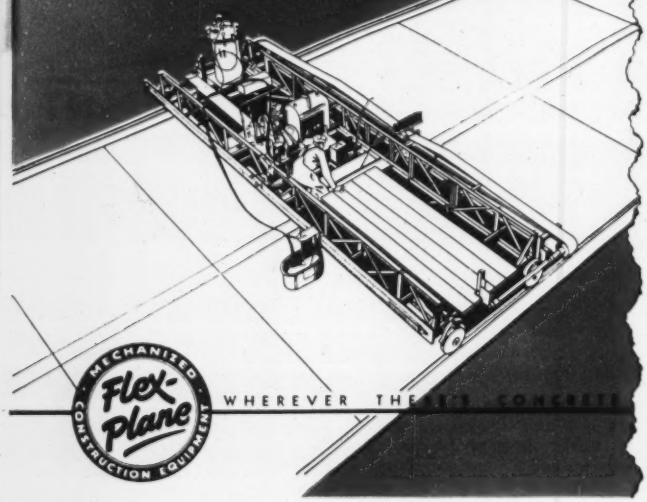
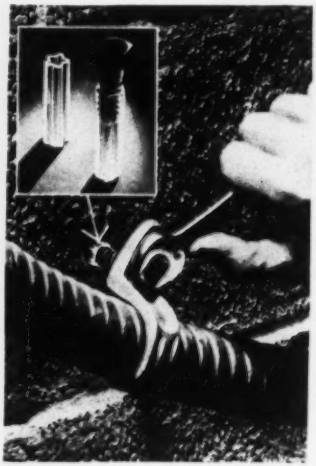


New products . . .

It's a rugged unit with easy-to-operate controls, and is built for long, dependable service in garages, job shops, and industrial plants. An easily read current indicator affords quick adjustment of welding current, according to the manufacturer. Maintenance costs are low because there are no moving parts, he says, and each part is designed for long life under tough operating conditions. AIRCO SALES, 60 EAST 42ND STREET, NEW YORK 17, N. Y.



Plastic screw anchors

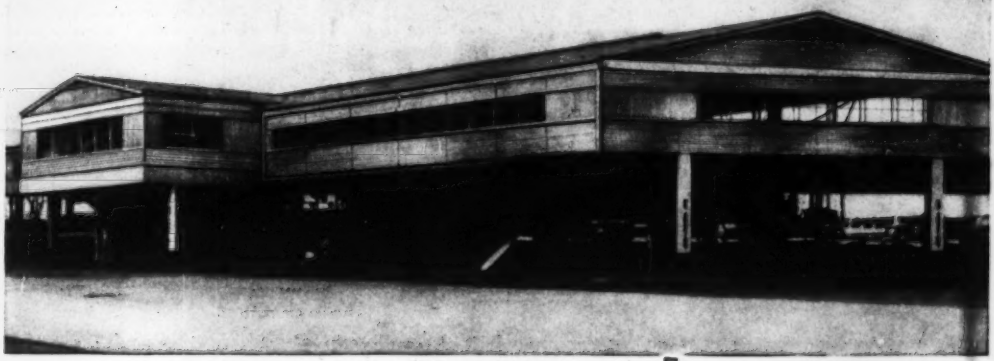
Here is a new type of screw anchor made of extruded Tenite plastic which the manufacturer says can be used to secure nails or screws in practically any solid material, such as brick, plaster, or cinder block. The anchor is hammered into a drilled hole in the usual fashion and then the screw or nail is inserted. The difference with the plastic is that it cold-flows into crevices of the hole to make a firmer grip. Manufactured over-size, Scru-Tite anchors give positive two-way grip and are said to have unexcelled holding power. They are available in all screw sizes, provide safe anchoring. It has the additional advantages over metal in that it is corrosion-proof as well as exceptionally high in impact strength. MASTERCRAFT PLASTICS COMPANY, INC., 95-32 150th STREET, JAMAICA 4, N. Y.

Condensation return units

Known as "Motor-Mount," these new units effect a considerable saving in fuel by returning the condensate from steam coils, radiators, or steam operated equipment back to the boiler. The complete line includes single and

(*Continued on page 95*)

LOWER COST LOAD ON LOADING RACK

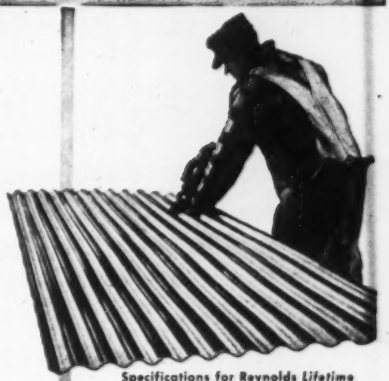


This Esso Loading Rack in Washington, D. C., illustrates the rapid trend to aluminum for gasoline distributing centers. This roofing and siding combines strength with light weight; cuts framing costs; reduces total weight of the superstructure. Corrosion resistance and freedom from rust mean long life with minimum maintenance—no painting. And aluminum's radiant heat reflectivity takes the sun load off the big roof area, keeps workers comfortable in summer.

In this Esso design, the lower part of the projecting office quarters is sided with Reynolds *Lifetime* Aluminum Weatherboard—for decorative contrast. All the rest of the walls and the roof are Industrial Corrugated. For literature, technical assistance and application details, call on Reynolds.

Offices in principal cities. Check your classified phone book for our listing under "Building Materials," or write: Reynolds Metals Company, Building Products Division, 2005 South Ninth Street, Louisville 1, Ky.

Aluminum is required for planes and other military needs. Reynolds *Lifetime* Aluminum Industrial Corrugated is still produced, but the total supply is necessarily reduced. Rated orders receive priority handling.



Specifications for Reynolds *Lifetime* Aluminum Industrial Corrugated:

Thickness .032"
Corrugations 7/8" deep, 2-2/3" crown to crown
Uniform load support (roof) 80 p.s.f. on 4' purlin spacing
Uniform wind load capacity (siding) 20 p.s.f. on girt spacings up to 7'9"
Roofing width 35", coverage 32"
Siding width 33-3/4", coverage 32"
Lengths 5', 6', 7', 8', 9', 10', 11', 12'

REYNOLDS ALUMINUM

REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

Like Thanksgiving Day and Turkey...

they Go Together

Sure-footed as a mule...the A-W Power Grader

Ride it down with the grader . . . that's the way to slope a bank! Keep the blade down under the frame where it belongs . . . where it will run smooth and true.

You can do it with an Austin-Western Power Grader, thanks to exclusive All-Wheel Drive and All-Wheel Steer. The live power in the front drivers grips the bank; the rear wheels are steered uphill, and the machine works steadily along the face of a slope too steep for an ordinary grader to negotiate.

Yes—All-Wheel Drive and All-Wheel Steer work together as a team to really go places and do things. We'd like to tell you the whole story . . . it's a good one.

AUSTIN-WESTERN COMPANY · *Subsidiary of Baldwin-Lima-Hamilton Corporation* · **AURORA, ILLINOIS, U.S.A.**

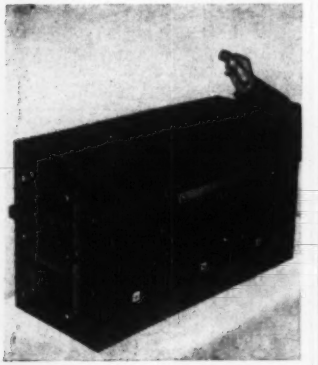
Austin Western

BALDWIN BLH LIMA HAMILTON

SINCE 1859—BUILDERS OF CONSTRUCTION EQUIPMENT

New products . . .

duplex units—the duplex units designed for conditions involving occasional demands in excess of the capacity of a single unit, or where a standby pump is desired to assure continuous operation under all conditions. A selection of 44 unit numbers in both single and duplex units are designed to handle from 2,000 to 40,000 sq. ft. of radiation. THE DEMING COMPANY, SALEM, OHIO.



Selenium rectifier power conversion units

Now available are new custom-made ac to dc rectifier power conversion units of high current and voltage capacities. Selenium rectifiers are the accepted media for converting alternating current to direct current, especially in applications where long life, instant operation at the flick of a switch, and complete freedom from maintenance are essential. The photo above shows the extremes of sizes. They are designed for and used with Syntron heavy tonnage vibratory feeders, grizzlies, bin vibrators, and electro-magnet hammers. Among other things, they may be used to supply dc power to arc welders, battery chargers, burglar alarms, dc motors, loudspeakers, hammers, vibrators, time clocks and elevator controls. SYNTRON COMPANY, HOMER CITY, PENNSYLVANIA.

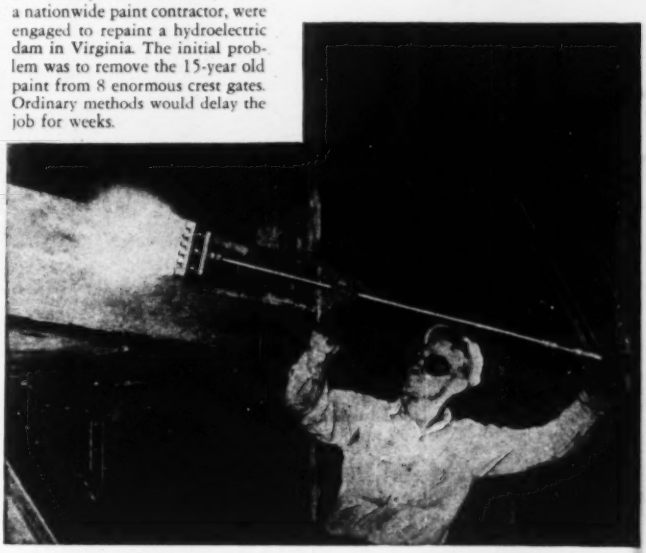
New high-speed spray gun operates semi-automatically

Two new metallizing guns have recently been announced for machine element work and for corrosion protection coatings. They are said to develop the highest spraying speeds yet available in guns designed for hand-held operation. They incorporate a patented jet-principle in the gas head which automatically compensates for

(Continued on page 96)

Flame cleaning speeds 'face lifting' on giant dam

MILLER CONTRACTING CO. OF OHIO, INC. located in Canton, a nationwide paint contractor, were engaged to repaint a hydroelectric dam in Virginia. The initial problem was to remove the 15-year old paint from 8 enormous crest gates. Ordinary methods would delay the job for weeks.



G. E. Hartwick, Airco Technical Sales Representative, suggested oxyacetylene flame cleaning with Series 9200 Torches and Airco Style 120 tips. Quickly and easily applied, the intense heat of the flame cockled the old paint, loosened scale and drove off surface moisture in a single operation.

The Miller Contracting Co. found that a flame cleaned surface made for a better finished paint job. An executive said, "We're convinced that flame cleaning is the most efficient and economical method of preparing steel surfaces prior to painting. We now use it almost exclusively for removing rust and scale."

• • • • •

TECHNICAL SALES SERVICE—ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

Technical Sales Service—though not a packaged commodity—is as readily available to all industry as any Airco process or product. If you have a metal working problem, ask to have a Technical Sales Division man call. Write your nearest Airco office.

AIRCO

AIR REDUCTION

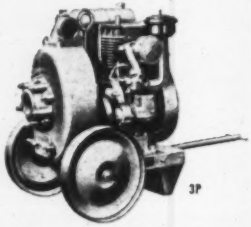
AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities

a JAEGER never races to prime

*Dewatering 1500′ of 8′ x 14′ deep sewer trench at a river crossing, this 4″ Jaeger pump handled 40,000 gph at an average speed of only 1200 rpm (10% to 15% lower speed than other pumps), and reprimed quickly, as needed, at 1400 rpm (compared with 1800 to 2000 rpm required to prime ordinary pumps).

Pump longer because they pull stronger at easy speeds

Jaeger "Sure Prime" Pumps are built oversize with larger shells and impellers, and generously powered. They hold more priming water and are subject to less abrasive wear. Exclusive double priming action is fast, dependable, without harmful racing of engine. No vapor lock even when pulling high vacuum on long intake lines—sustained efficiency on non-stop pumping, and thousands of extra hours of service from both pumps and engines.



Other sizes 1½" to 10"

See your Jaeger distributor or send for Catalog P-10

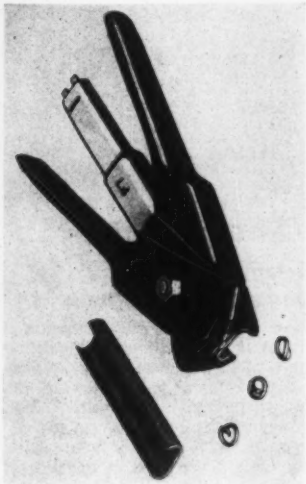
THE JAEGER MACHINE COMPANY

200 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY

New products . . .

variations in gas pressure as high as 10 lb. Because of this new feature, they are said to be the nearest thing to automatic operation yet devised. The Metco Type 4E gun is designed to spray all wires from 20 gage to ⅛ in. in any metal at speeds up to 40 percent faster than previous models. The Type 5E is the first gun designed for high-speed spraying of the softer metals, such as zinc and aluminum, for protection of equipment and structures against corrosion for periods ranging from twenty to thirty years. METALLIZING ENGINEERING COMPANY, INC., 38-14 30TH STREET, LONG ISLAND CITY 1, N. Y.



Automatic feed plier

Wire, rods, cords and cables up to ½″ in diameter can easily pass through the opened staple which can be closed as small as ⅛″ on this new hog-ring type stapler. Known as Model P7, the machine is just about the size of an ordinary pair of pliers, and can fit very easily into a mechanic's pocket. It uses staples which are sharply pointed for easy penetration of fabrics. BOSTITCH, INC., 499 MECHANIC STREET, WESTERLY, RHODE ISLAND.

Self-priming Motorpumps

Conventional centrifugal pumps are unable to eliminate appreciable volumes of air or vapor when operating under suction lift and completely lose prime when such vapor is present. To reestablish prime, it is necessary to fill the suction line and casing before starting. According to the manufac-

(Continued on page 100)

RUSH ORDER *Plants Go Up On Time...*

Ceco open-web steel joists are especially suitable for roofs of one-story defense plants. Their light weight permits speedy installation without special equipment or falsework—also reduces the size of supporting beams, columns and footings. More manufacturing area is made available.

-with Open-Web Steel Joist Construction

There's need for speed in building today—an urgency that has to be met. For the nation's industrial plants must expand so enough of the things vital to defense can be made in quantity—quickly. And to help you complete more plants "on time", open-web steel joist construction truly meets the need. Here is the fastest way ever to build, with a saving in labor, too. No temporary framework is necessary—there's nothing to take down. So since speed is the need on "rush order" plants, specify Ceco open-web steel joists. They are fabricated to exact sizes in the factory, come to the job tagged, ready to install. Ceco assures you fast service from five strategically located plants: Birmingham, Chicago, Houston, and the New York and Pittsburgh areas. When speed's your need—call Ceco. Ask for new steel joist catalog.

CECO STEEL PRODUCTS CORPORATION

General Offices: 5601 West 26th Street, Chicago 50, Illinois

Offices, warehouses and fabricating plants in principal cities

CECO STEEL®

In construction products **CECO ENGINEERING** *makes the big difference*

A. Flushing, L. I.—GPX forms being removed from set concrete. GPX can be re-used literally scores of times!

B. Lipton Tea Building, Galveston, an outstanding monolithic example where GPX cut grinding and pointing costs!

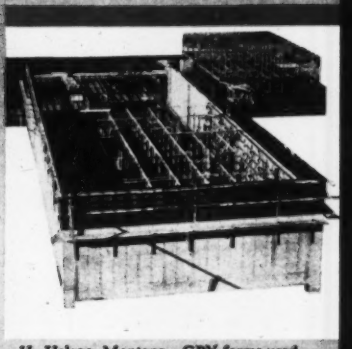
C. Sheepshead Bay Project, Brooklyn, New York—GPX forms used for smooth, speedy pouring of columns and beams.

D. Flushing, L. I.—This ceiling, made with GPX forms, is ready for painting—no plastering or refinishing needed!

E. With GPX for concrete forms, builders of the vast housing project at Flushing, L. I., saved time, work and money.

F. Flushing, L. I.—Pouring concrete into GPX forms. GPX slashes refinishing costs, doubles production capacity.

G. Manhattan's mammoth Jacob Riis Housing Project—GPX saved builders $50,000 to $100,000 in time and materials.



H. Helena, Montana—GPX forms used for foundation of War Memorial Bldg.

I. Lester Patterson Houses in New York—GPX does a cost-cutting, time-saving job, can be used over and over again!

J. Six 14-story Algonquin Apartment buildings, Chicago. GPX was re-used 14 times in pouring floor and roof slabs.

K. An aerial shot of Brooklyn's Gowanus project where GPX concrete forms were re-used dozens of times!

GPX is an extremely high-grade exterior Douglas Fir Plywood with a superior plastic overlay applied under heat and pressure at the time the plywood veneer layers are being bonded. RESULT: the plastic flows, condenses and sets, forming a hard plastic surface that has become *a part of the plywood itself!* GPX is 20 to 25 times more resistant to water absorption than ordinary plywood, impervious to acids, molds, termites and fungi. The large, lightweight panels are easy to handle, easy to work...take nails to the edge without splitting or cracking.

.....PLASTIC-FACED PLYWOOD IS REVOLUTIONIZING CONCRETE FORM USE

Armor-hard, satin-smooth GPX plastic-faced plywood is saving time, work and money for builders and contractors everywhere. For example, GPX Concrete Form grade was used exclusively in the Lester Patterson project in New York. Ceilings poured into GPX forms were ready for painting after minor grinding and smoothing operations . . . saving 3 coats of plaster finish *and* $50,000 to $100,000 in materials and labor.

GPX's amazing wear resistance is proved by its application in New York's Brooklyn-Battery Tunnel where *52 re-uses* of GPX forms were obtained.

Monolithic construction becomes a *practical* reality with GPX. The new Lipton Tea Building in Galveston, Texas, testifies to GPX's economy in drastically reducing prohibitive refinishing costs.

Investigate GPX today. It is a quality product of Georgia-Pacific Plywood Company, with practically unlimited application for building, industry and on the farm.

Send for this new folder on GPX if you have a job where smoothness, lightweight strength and ruggedness pay off. Write Georgia-Pacific Plywood Company, 609 North Capitol Way, Olympia, Washington, or get in touch with your nearest Georgia-Pacific office.

GEORGIA—PACIFIC
PLYWOOD COMPANY

OFFICES OR WAREHOUSES IN: Augusta, Birmingham, Boston, Chicago, Columbia, Louisville, Memphis, Nashville, Newark, Olympia, Orlando, Philadelphia, Pittsburgh, Raleigh, Richmond, Savannah.

OWENS take in "A LOT OF TERRITORY"...

they're DESIGNED and BUILT for that!

CLAMSHELL BUCKETS
BIGGER DAYS WORK

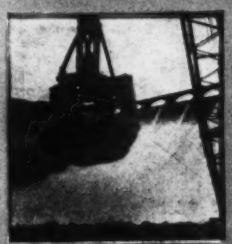
"A Mouthful at Every Bite," with more bites per day takes in a "lot of territory," whether you're operating in sand, gravel, mud or coal with an Owen Bucket on your boom.

Owens are on the job in lots of territories all over the world. Insuring a bigger day's work, *every day* and satisfying more operators and contractors *every day*.

Rapid loading of hopper cars is easily accomplished with this Owen Bucket.

OWEN ROCK GRAPPLES of improved, latest design are available in various types with full blade, semi-blade, or rock tine independently acting tines.

Write for the catalog.



"A mouthful at every bite"

THE OWEN BUCKET CO.

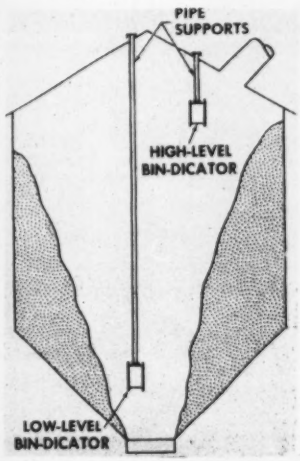
6010 Breakwater Avenue • Cleveland 2, Ohio

Branches: New York, Philadelphia, Chicago, Berkeley, Calif.

New products . . .

turer, these Motorpumps overcome this disadvantage by means of recirculating liquid trapped within the casing. The pump impeller discharges through two passages into a discharge chamber. During priming the upper passage discharges a mixture of vapor and liquid into the discharge chamber. Here the vapor separates from the liquid and passes out through the discharge pipe. The remaining liquid re-enters the impeller through a lower passage, there mixes with more vapor drawn in from the suction line, and is separated from the liquid in the same manner. When the suction line is finally filled with liquid and the pump is primed, flow through the lower passage reverses and both passages act as normal pump discharges. No flat valve is used because the pump casing is so proportioned that sufficient liquid is always trapped on shutdown to insure priming when the unit is restarted.

The pump is built in sizes from 1 to 25 hp., with capacities up to 800 gpm., and a head up to 180 ft. They are also available mounted on ball-bearing equipped cradles to be driven through a coupling by a motor, engine, or turbine. INGERSOLL-RAND COMPANY, DEPARTMENT CAM, 11 BROADWAY, NEW YORK 4, N. Y.



Bin-level indicator

The problem of securing dependable level indication in large bins has been greatly simplified by this new Bin-Dicator. It is designed for suspended installation (as shown in the attached drawing) from above, and can therefore be located anywhere in the bin where there will be a free

(Continued on page 103)

Figure your costs with BARCO for the "low bid" on any job!

SOIL COMPACTION JOBS no longer need present problems. With Barco Rammers, progressive contractors throughout the Nation are finding that specifications calling for 95% to 97.5% compaction represent opportunities for profitable work. FOR THE LOW BID ON ANY JOB, FIGURE YOUR COSTS WITH BARCO!

See for yourself; ask for a demonstration. *Worldwide Sales and Service.* BARCO MANUFACTURING COMPANY, 1814M Winnemac Avenue, Chicago 40, Illinois. *In Canada:* The Holden Co., Ltd., Montreal, Canada.

AREA TAMPING—On high degree specified compaction with 12" to 20" lifts, the Barco Rammer will cover from 1 to 1½ square yards of surface per minute. This means 20 to 30 cu. yds. of fill per hour, or 160 to 240 cu. yds. per 8 hr. day per Rammer.

TRENCH TAMPING—On trench back-fill, one Barco Rammer will tamp a trench 18" wide at the rate of 6 to 10 feet per minute or 360 to 600 feet per hour. Depending on soil conditions, lifts up to 24" may be used.

- SELF-CONTAINED
- PORTABLE
- ONE MAN OPERATION
- FASTER COMPACTION
- BETTER COMPACTION
- LOWER INITIAL COST
- LOW OPERATING COST
- SAFE, EASY TO USE!

BARCO

"Pegson" Gasoline RAMMER

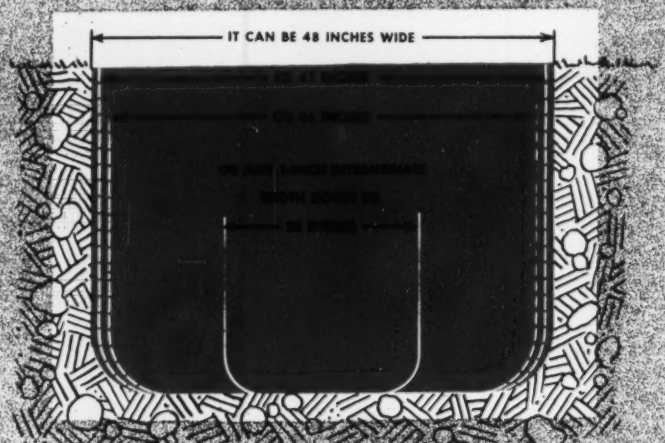
For Soil Compaction Close to Walls, Culverts and Abutments — in Trenches, Ditches

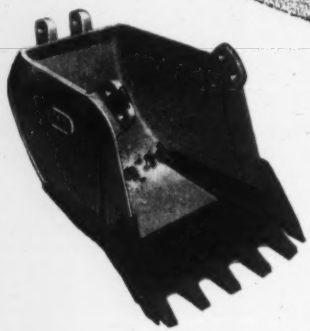
FREE ENTERPRISE — THE CORNERSTONE OF AMERICAN PROSPERITY

TAILOR-MADE* DITCH

with

ESCO FASTBACK HOE DIPPER





and you dig 'em all with one machine

The trench dug by an *ESCO* FASTBACK hoe dipper is a genuine tailor-made job. It's the exact width you want. You dig and backfill only what your contract calls for. And you neither overload your machine nor get less than its full capacity.

For example, the ¾ yard FASTBACK is made in three basic widths. Simply by changing side cutters each basic unit gives you *seven* different widths. Thus one machine, while producing ¾ yard loads, can dig trenches anywhere from 28 to 48 inches wide.

ESCO catalog 189 explains construction in detail and gives details of sizes, dimensions and weights. Get your copy from your nearest *ESCO* representative, or send us the filled-in coupon.

** Example is for ¾ yard bucket. Other sizes from ¼ yard to 2½ yards have digging widths ranging from 20 to 63 inches.*

ESCO Dippers, Hoe Dippers, Dragline and Coal Loading Buckets

ELECTRIC STEEL FOUNDRY

2167 N. W. 25th Avenue, Portland 10, Oregon

SALES OFFICES AND WAREHOUSES

CHICAGO, ILLINOIS — NEW YORK CITY, NEW YORK
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MANUFACTURING PLANTS

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Representatives in all Major Cities

ELECTRIC STEEL FOUNDRY
2167 N. W. 25th Avenue, Portland 10, Oregon

Please send me a copy of your Catalog 189 giving details of ESCO FASTBACK hoe dippers.

Name_____

Company_____

Address_____ Zone_____

City_____ State_____

Make and model of machines used_____

New Products . . .

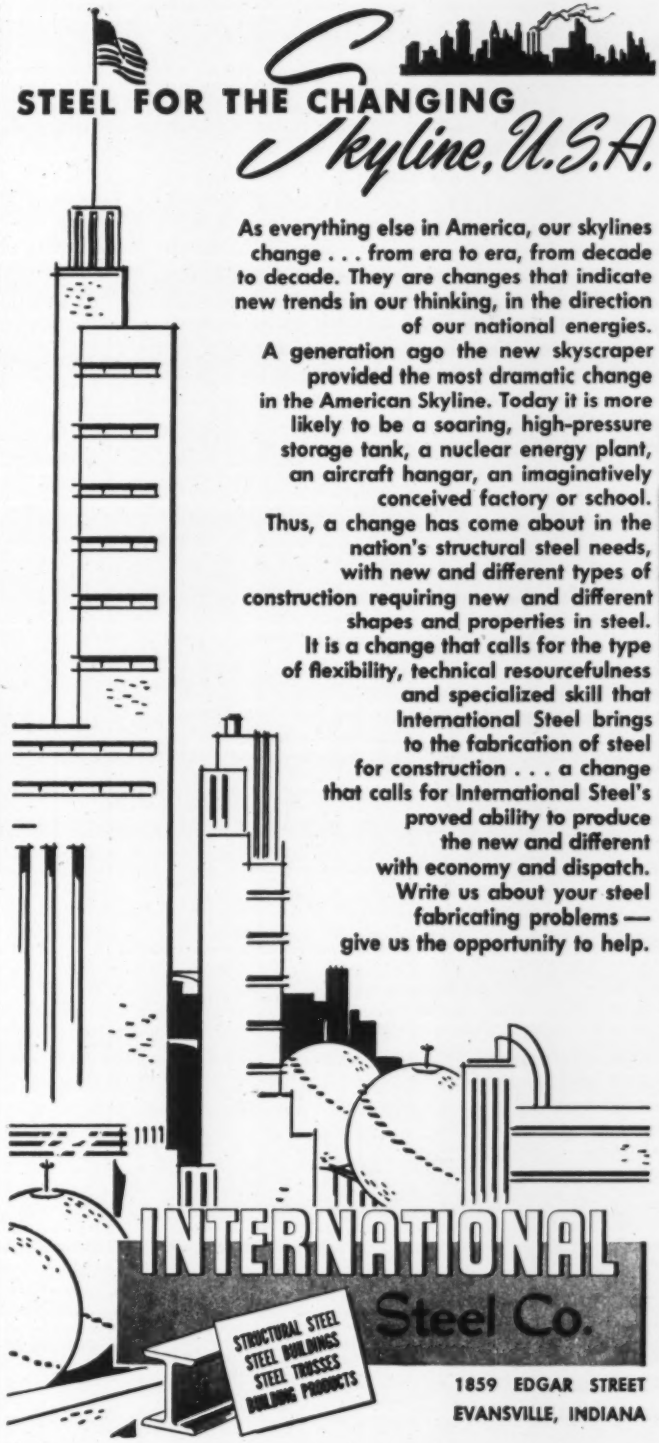
flow of materials to and away from its diaphragm. This flexibility as to location permits the successful application in bins containing materials which tend to build up on the walls of the bin and to flow down through the central area only. Under these and similar conditions, some indicators mounted on the bin wall would not function properly. The new model indicator, mounted in the area of moving material, gives dependable indication of high and low levels, according to its maker.

The unit has been designed to be drilled and tapped to take any size pipe up to 2". The support pipe also accommodates electrical wiring, making conduit runs unnecessary. The installation can be easily moved up or down inside the bin to operate at different levels or may be lifted out entirely for inspection. THE BIN-DICATOR COMPANY, 13946-55 KERCHEVAL, DETROIT 15, MICHIGAN.

"Magic Marker" writes on anything

Here is a throw-away-bottle marking unit with an ability to write on a greater variety of surfaces than has ever been possible with one device before, according to its manufacturer. It writes with a felt tip which is designed to permit fine, medium or bold markings. When the ink supply is finally exhausted, the nib section is unscrewed from the bottle and attached to a fresh refill.

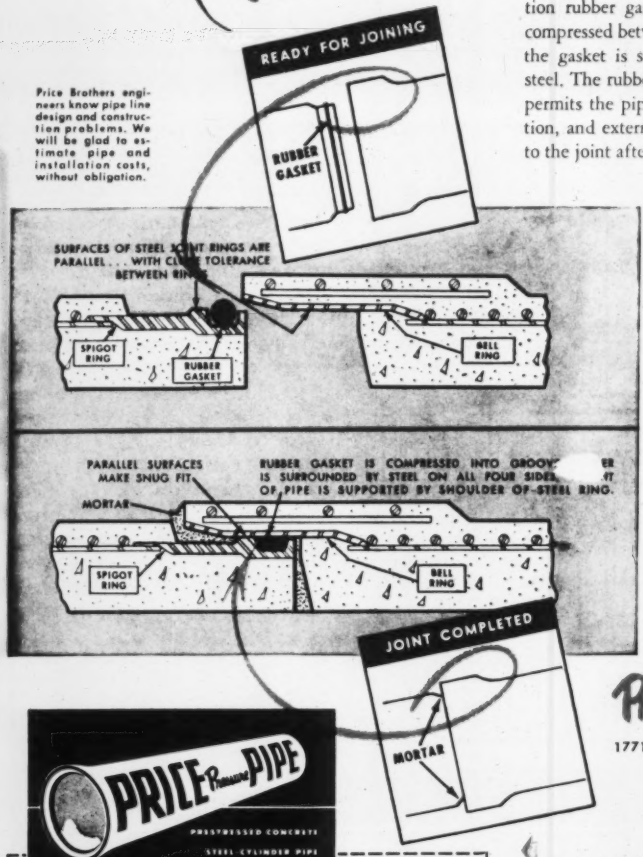
Said to be instant-drying, waterproof, sunfast and translucent, it can mark with equal ease on porous or non-porous surfaces. Made in nine colors including black and white, it is spillproof, since it has no loose ink. All the ink is held within a felt pack inside the bottle. Control of the ink to the writing nib is automatic, too, through special felt density-control. SPEEDRY PRODUCTS, INC., 19 RECTOR STREET, NEW YORK 6, N. Y.


STEEL FOR THE CHANGING
Skyline, U.S.A.
As everything else in America, our skylines change . . . from era to era, from decade to decade. They are changes that indicate new trends in our thinking, in the direction of our national energies.
A generation ago the new skyscraper provided the most dramatic change in the American Skyline. Today it is more likely to be a soaring, high-pressure storage tank, a nuclear energy plant, an aircraft hangar, an imaginatively conceived factory or school.
Thus, a change has come about in the nation's structural steel needs, with new and different types of construction requiring new and different shapes and properties in steel.
It is a change that calls for the type of flexibility, technical resourcefulness and specialized skill that International Steel brings to the fabrication of steel for construction . . . a change that calls for International Steel's proved ability to produce the new and different with economy and dispatch.
Write us about your steel fabricating problems — give us the opportunity to help.
INTERNATIONAL
Steel Co.
STRUCTURAL STEEL
STEEL BUILDINGS
STEEL TRUSSES
BUILDING PRODUCTS
1859 EDGAR STREET
EVANSVILLE, INDIANA

HOW Steel and Rubber MAKE A SELF-CENTERING, FLEXIBLE HIGH PRESSURE JOINT...

This rubber and steel joint has proven highly successful in high-pressure water lines. The spigot ring fits snugly inside the steel bell ring of the adjoining pipe. A special composition rubber gasket, recessed in the spigot ring, is tightly compressed between the two rings. When joint is completed, the gasket is surrounded on all four sides by zinc-coated steel. The rubber gasket maintains a flexible connection that permits the pipe to adjust to expansion, contraction, vibration, and external loads without leakage. Mortar is applied to the joint after pipe is laid.

Price Brothers engineers know pipe line design and construction problems. We will be glad to estimate pipe and installation costs, without obligation.


READY FOR JOINING
RUBBER GASKET
SURFACES OF STEEL JOINT RINGS ARE PARALLEL . . . WITH CLOSE TOLERANCE BETWEEN RINGS
SPIGOT RING
RUBBER GASKET
BELL RING
PARALLEL SURFACES MAKE SNUG FIT
RUBBER GASKET IS COMPRESSED INTO GROOVE IS SURROUNDED BY STEEL ON ALL FOUR SIDES OF PIPE IS SUPPORTED BY SHOULDER OF STEEL RING.
MORTAR
SPIGOT RING
BELL RING
JOINT COMPLETED
MORTAR

PRESTRESSED CONCRETE STEEL-CYLINDER PIPE

Longest-trouble-free service at lowest cost

Prestressed Pipe combines the strength of steel, the protection of concrete and the flexibility of a rubber joint to provide *a combination of advantages found in no other pipe*. It has a life expectancy of 100 years and more, highest carrying capacity, and water tightness under highest pressures. Its great structural strength provides safety from sudden and complete failure. It is easy to lay, easy to tap, and provides great flexibility in design.

Prestressed Concrete Steel-Cylinder Pipe is available in 16 foot lengths and in the following diameters: 16", 20", 24", 30", 36", 42", 48" and larger.

Price Brothers Company

1771 EAST MONUMENT AVENUE, DAYTON 1, OHIO

PRICE Pressure PIPE
PRESTRESSED CONCRETE STEEL CYLINDER PIPE

Please send me booklets on Prestressed Pipe.

☐ Manufacturing and Prestressing ☐ Tapping under Pressure ☐ AWWA Specification No. 78.2-7

NAME_____

TITLE_____

ORGANIZATION_____

ADDRESS_____

1771

Send for these fact-packed booklets on Price Brothers Prestressed Concrete Steel-Cylinder Pipe.

Installing Price Brothers Prestressed Pipe on the 80-mile Saginaw-Midland project, one of America's longest high-pressure water supply lines. Pull shovel lays pipe and pushes joint together.

MANUFACTURERS' PUBLICATIONS

Mastic flooring underlayments – The composition and mixtures for asphalt emulsion and rubber latex binders are described together with recommended practice in application in this 4-page folder. Flooring underlayments are used to provide a smooth, level base, resistance to shock, effective sound deadening and moisture resistance for installations of decorative floor coverings. THE FLINTKOTE COMPANY INC., 30 ROCKEFELLER PLAZA, NEW YORK 20, NEW YORK.

Extruded plastics–The 1952 edition of this bulletin is now out, describing the latest applications of custom made thermoplastic extrusions and is written and presented to help the reader visualize their uses in his own field. A table is included listing a digest of properties of thermoplastics. ANCHOR PLASTIC CO., INC., 533 CANAL STREET, NEW YORK 13, N. Y.

Renting steel piling–A new 8-page illustrated brochure lists advantages of renting steel sheet piling and giving engineering details of interlocking sections. It contains specifications for piling sections, as well as corners and connections, of the three leading manufacturers of steel sheet piling. Data are also given on pile hammers and extractors available through the Foster Co.

Six large construction projects are shown in photographs—where contractors were faced with unusual construction obstacles. L. D. FOSTER COMPANY, P. O. BOX 1647, PITTSBURGH 30, PA.

Steam in a package–is the title of an informative booklet about Steam-Pak Generators showing all manufacturing, installation and operating advantages. An open-fold center sheet shows a self-explained cutaway view of one of the boilers for packaged heat, packaged hot water, packaged steam and packaged power. Complete details of specs, applications and dimensional drawings are available. YORK-SHIPLEY INC., YORK, PENNSYLVANIA.

Corrosion resistance of copper and copper alloys–This booklet is the result of years and years of continuous laboratory research and field study of the nature of corrosive attack on copper and copper alloys. The 24-page booklet, first of its type in the industry, explains the chemical and physical

(Continued on page 108)

VICTAULIC...
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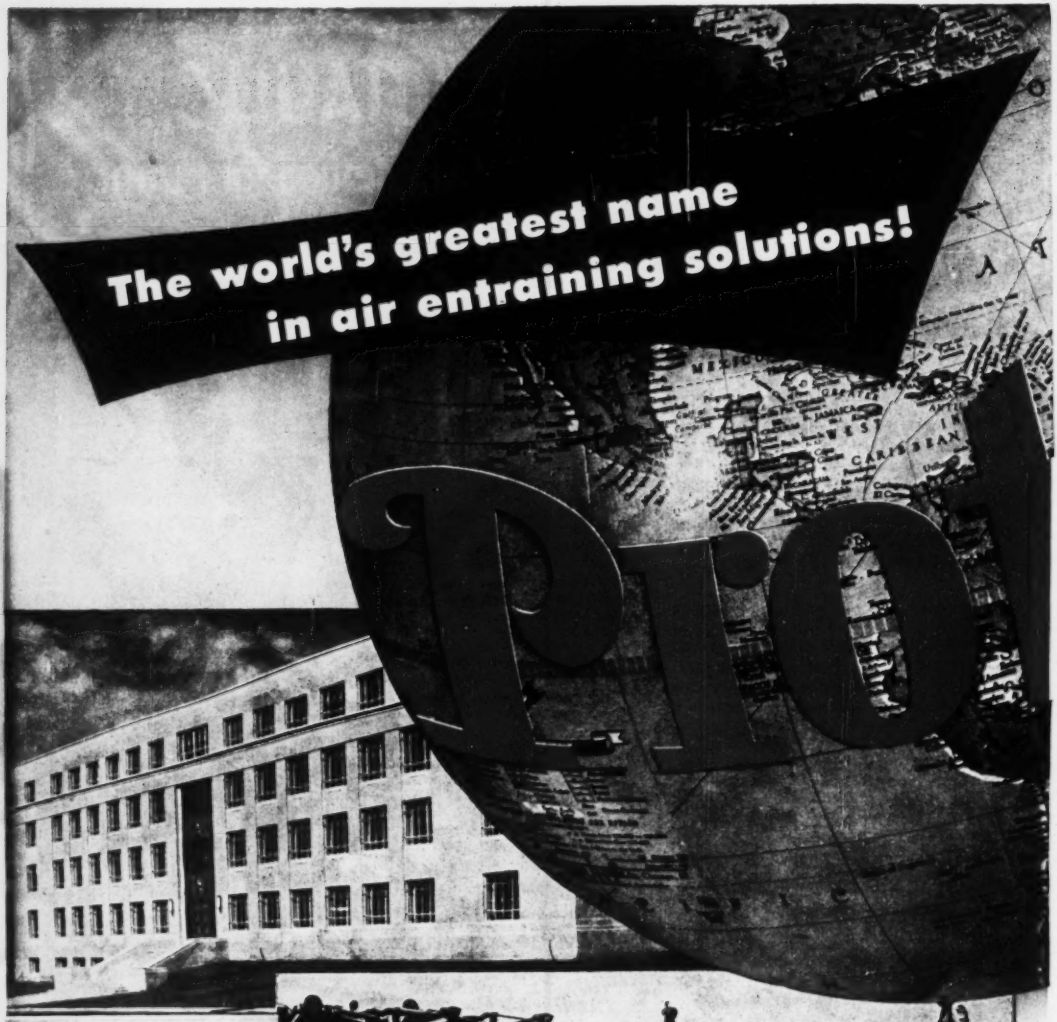
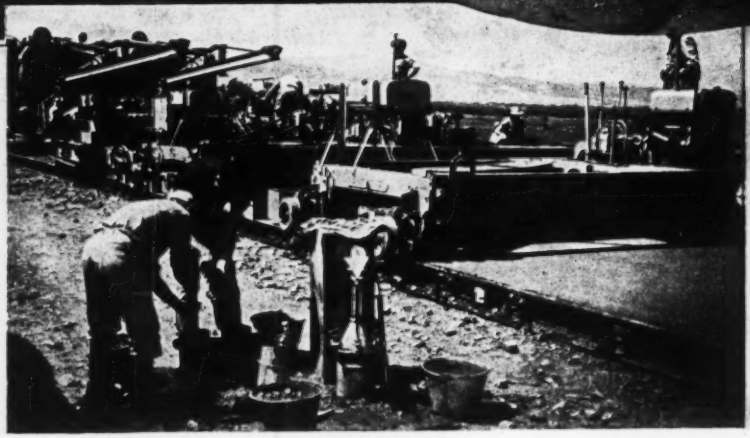


The Sam Mitchell State Office Building in Helena, Montana. Contractors: Dudley Construction Co., Helena, Montana. Protex concrete supplied by Helena Sand and Gravel Co. of Helena.



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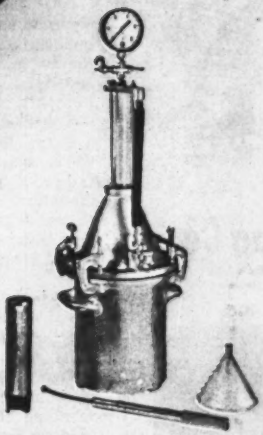

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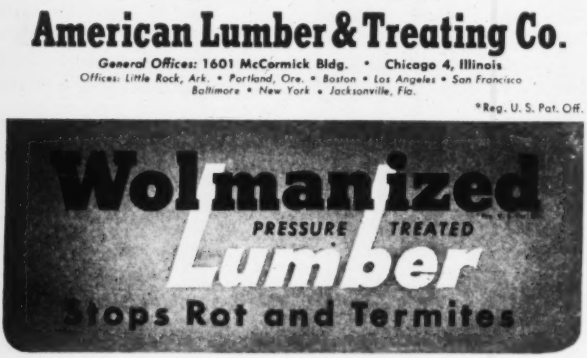


Publications . . .

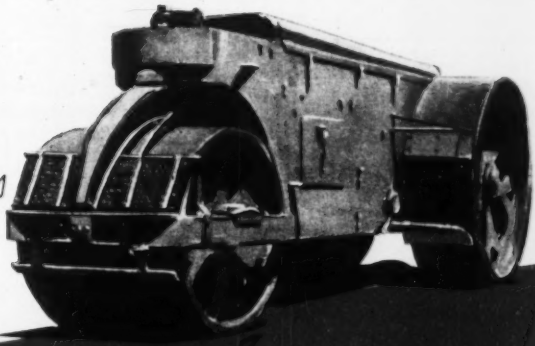
nature of corrosive attack in its various forms. Included is a tabulation indicating the relative corrosion resistance of the principal types of copper and copper base alloys when in contact with 183 different corroding agents. This booklet, Anaconda Publication B-36, is available from THE AMERICAN BRASS COMPANY, WATERBURY 20, CONN.

Engineered industrial floors—According to this company, any capable contractor can put down a wood or cement floor that will fully meet requirements in most cases but the flooring specialist is being called in more often than not nowadays when floors are required to take the severe beating of modern industrial usage. Accordingly, this 12-page illustrated catalog points out why the installation of industrial floors for maximum life and minimum cost is a task requiring experienced planning, skilled technical execution, and exacting cost control. It describes how floors can be engineered to withstand moving and deadweight loads, shock and vibration, extremes of temperature, oils, greases, chemical and industrial wastes, and other destructive agents. For free copy write to FLASH-STONE COMPANY, INC., PHILADELPHIA 44, PENNSYLVANIA.

Tractor attachments—This new bulletin No. 895 describes hydraulic and cable-controlled earthmoving equipment manufactured by the Baker Mfg. Co. to match Allis-Chalmers crawler tractors. Included are the engine-mounted hydraulic control bulldozers, grade builders, and roof rippers for the HD-5, HD-9, HD-15, and HD-20, and the three cable control units, HD-9, HD-15, and HD-20.

Specifications are listed showing at a glance the moldboard height and width, height of lift, depth of cut, degree of tilt, weight of blade and mounting, as well as overall length of tractor and blade for every model. THE BAKER MANUFACTURING COMPANY, SPRINGFIELD, ILLINOIS.

Wall forms—Here is a revised and enlarged 40-page booklet illustrating all types of concrete structures on which Atlas All-Steel forms were used. It contains line drawings and complete directions for the erection and dismantling of these forms. It also includes a data sheet for the submission of rough sketches for further information and quotations on cost of rental and purchase of the Atlas Steel Forms. IRVINGTON FORM AND TANK CORPORATION, 20 VESEY STREET, NEW YORK 7, N. Y.



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If so, you may find—as other planners do—that Transite* Pressure Pipe can help provide a practical answer to your problem. For this pipe, in addition to its continuing, long-term savings, offers an opportunity for economies in installation *that may go far in helping you contend with rising costs and manpower shortages.*

Transite Pressure Pipe offers a combination of advantages which speed and facilitate water main installations all along the line—from the time the pipe is first received, to final placement of the line in service and restoration of normal street traffic. Not only do pipe laying crews find this modern pipe easy to work with, but its unique features make for a more compact, efficient and economical operation in virtually all the construction phases of water-line extension projects.

Economies start as soon as a shipment of Transite Pipe is received. Because it is light in weight, unloading and other handling operations are simplified. More footage can be carried per truckload, trucking costs are lowered, and distribution on the job site is faster. And except for the larger diameters of pipe, the sections can be lowered into the trench by hand, or with the aid of rope slings.

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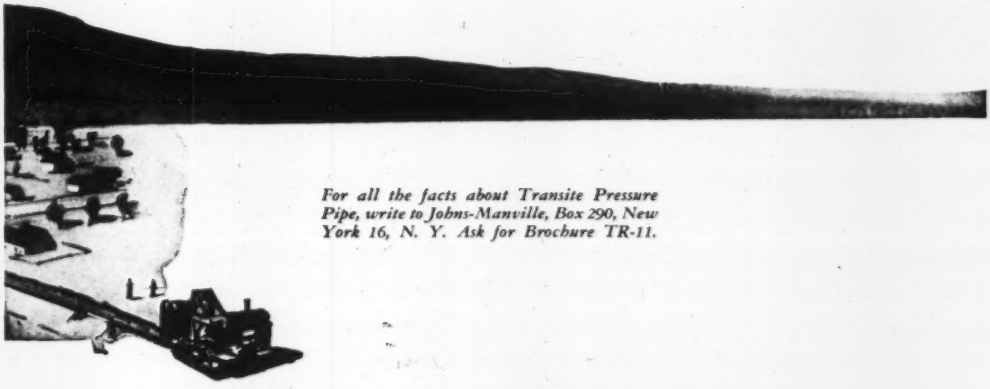
Makes pipe-laying an assembly-line operation

This combined feature of rapid assembly and assurance of joint-tightness as fast as the line is laid, is the key to an important Transite advantage: it means that trench excavation, pipe laying, and backfilling operations can follow in quick succession—often under the supervision of one foreman. It makes pipe-laying virtually an assembly-line operation in which the trench can be closed in a minimum of time. This assures more economical use of excavation and earth handling equipment, reduces the expense and hazards of long stretches of open trench, and helps button-up the job with the least possible expenditure of time, labor and money.

These *initial* savings . . . plus the *long term* economies that have been effected in thousands of installations . . . are two good reasons why you should have the complete story about this modern asbestos-cement pipe developed and produced by Johns-Manville to carry water more efficiently and more economically.



For all the facts about Transite Pressure Pipe, write to Johns-Manville, Box 290, New York 16, N. Y. Ask for Brochure TR-11.

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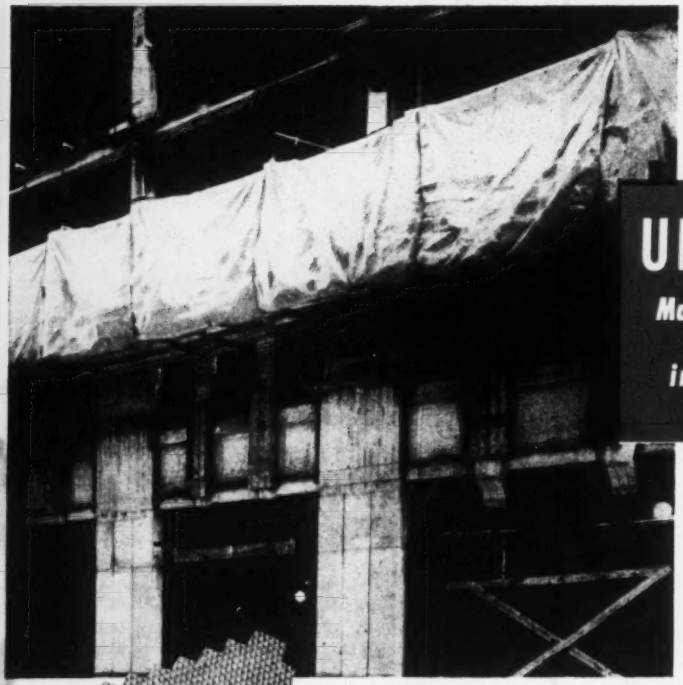

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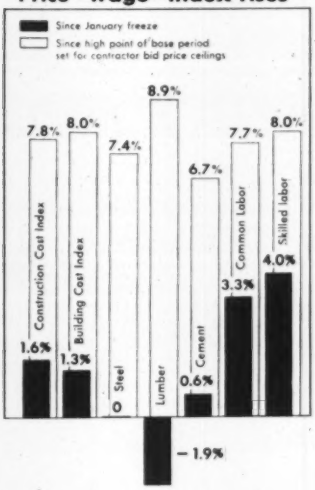
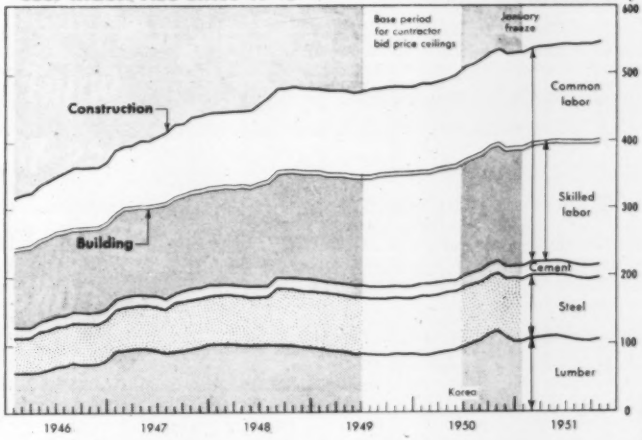
Price-wage-index rises



Cost index rise since 1945



1951 SUPPLEMENTAL REPORT ON

Construction Costs

Metal shortages and government controls rule construction these days—volume controls, designed to take the pressure off materials supplies (and prices), and cost controls to hold the price line in the face of heavy defense construction. How they have affected cost since ENR's last special report (Mar. 29, 1951) is the main theme of this issue.

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Volume controls are back of the drastic enforced slowdown of private housing and commercial building. They have cut back mass housing contracts 42 percent below their 1950 rate and have held new commercial building down 35 percent below last year's record pace.

Price and cost wise, the January 26 freeze has been more effective on materials prices than it has been on wage rates. The ENGINEERING NEWS-RECORD cost indexes, for example, have gone up 1.3 to 1.6 percent since the first of February but their materials cost component is down 0.9 percent, while their labor components are up 3.3 to 4 percent. The lower materials cost component is due entirely to a lumber price drop.

The contractor building cost indexes are up 1.7 to 3 percent since December 1950, except Aberthaw which is up 10 percent. Both of the ENR Cost Indexes are up 3 percent since December.

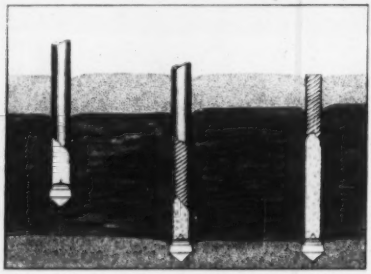
The contractor bid price indexes indicate that 2nd quarter prices this year were 4 percent above the 4th quarter last year and 15 percent above a year ago for the composite mile average as given by the Bureau of Public Roads. California Highway Department indexes show an increase of 22 percent since the 4th quarter last year and 32 percent since the second quarter.

These indexes that record construction's pulse and temperature are reported in this issue on a wall chart supplement backed by tables that show the numerical values.

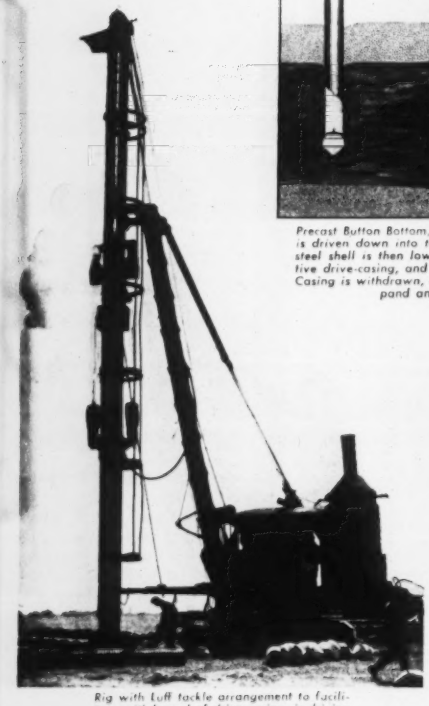
Two new index series are introduced, a 21-cities series for the ENR Cost Indexes shown on the chart supplement, and a Bureau of Reclamation series for irrigation and hydropower construction costs in an accompanying page in the magazine.

• **21-cities**—For the first time the ENGINEERING NEWS-RECORD cost indexes are shown for each of the 21 cities for which construction materials prices and wage rates have been reported over the years. These use the local prices of cement and lumber, local wage rates, and the mill price trend for structural steel, weighted the same as the parent indexes. In Montreal, however, warehouse price of steel was used with an adjustment in the weighting to allow for the different price

WHAT KIND OF PILES WILL PREVENT SETTLEMENT DUE TO CONSOLIDATION?



Precast Button Bottom, followed by steel drive-casing, is driven down into the bearing stratum. Corrugated steel shell is then lowered undamaged inside protective drive-casing, and locked onto the Button Bottom. Casing is withdrawn, allowing compressed soil to expand and grip pile shaft.



Rig with Luff tackle arrangement to facilitate withdrawal of drive-casing, is driving precast Button Bottom and steel casing.

PROJECT: *Foundations for New Buildings at the Philadelphia International Airport*

WESTERN drove 3700 Button Bottom piles through the hard crust of dense rolled sand fill, through the soft layer of peat and mud below it, and placed the entrie load in the hard bearing stratum of compacted sand and gravel. Use of piles which develope a part of their bearing in the hard fill near the surface would have given a false indication of bearing value. Such piles would have been subject to ultimate settlement due to consolidation of the intermediate soft layer.

The cylindrical Button Bottom pile gets its full bearing values in the dependable bearing stratum. Frictional bearing values, which accrue after withdrawal of the drive-casing, are an additional safety factor.

The very high pressure in the rolled sand fill made difficult the withdrawal of the drive-casing, after completion of the pile. Western designed an unusually powerful method for withdrawing the drive-casing to overcome this difficulty. By use of a Luff tackle arrangement, it was possible to almost double the 45-ton capacity normally available on rigs of the type used.

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stratum and a heavier weighting was used for cement.

No corrections are made in these local cost indexes for variations in productivity between high-wage and low-wage areas, hence these indexes should not be used as construction selling price differentials without testing for productivity.

• **Irrigation and hydro-power construction price indexes**—The Bureau of Reclamation indexes shown on an accompanying page should be doubly welcome because they cover types of construction not heretofore covered by special purpose indexes; and they measure cost trends in the West where few indexes have hitherto been available.

• **Wholesale prices** of buildings materials reported by the Bureau of Labor Statistics were down 1.4% in September from their January values due to a drop in lumber of 3.8%, in paint materials of 4.0%, in plumbing of 0.7% and in brick and tile prices of 0.7%. Cement and steel were unchanged. Prepared paints were up 1.2%, plumbing and heating prices were up 0.4% and other materials prices in the index were 1.3%. The average of all commodities in the BLS wholesale price index was down 1.4%.

• **The consumer's price index** of the BLS, to which more and more wage contracts are hitched for automatic escalation, climbed 2.8% from January 15 to September 15.

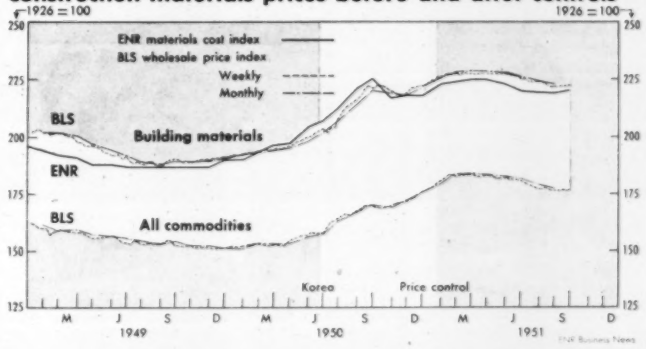
• **Area wages** set up by the Wage Stabilization Board are now coming through in a steady stream, some of them 5 cents higher than wages reported through September, others at the rates reported for the September round-up for 60 cities reported here on another page. The area rates that had been released up to the time of going to press are shown on the table where they affect the cities represented. Many other areas apart from these cities have their area rates established.

• **Foreign wage and prices**—Americans are not alone with their higher construction prices and rising wage rates. Around the world they have company, as a September round-up shows of conditions in 26 nations. These prices and wages are reported in the accompanying pages.

• **Compensation insurance**—Here is one place where costs are way down. The causes and effects of lower costs in the face of rising benefits to injured workmen are examined in an accompanying report against a background of construction's safety record.

• **Unit prices** are shown here in several forms: itemized bids by contractors for public works, square and cubic costs of buildings reported by their builders, costs per ton of capacity of incinerators reported by their engineers. These give actual cost of many kinds of projects.

Construction materials prices before and after controls



Contractors face a new set of controls on their prices after November 1. Base costs must be estimated and the markup for profit must not exceed 90% of the highest markup used or quoted during the base period. This base period is the 360 days between July 1, 1949 to June 24, 1950. How this effects unit price, lump sum, and cost plus bidding was reported in detail in ENR October 18, 1951 pages 23, 24 and 25.

• **Competition** fell off this year on construction. Some projects drew only one or two bidders, and awards were made to single bidders of work that in days gone by would have been readvertised to seek more competition. Some bidders qualified their bids with clauses "If low on this job all other bituminous bids voided" and "will not accept more than one job at this letting." California reports an overall average of 5 bidders per project this year compared with 7.3 competing for state highway jobs a year ago.

• **Escalation** clauses went back into contracts, starting about a year ago. Most of these set a 10% stopper. One, a sewage treatment plant in Fairfax, Va. set 15%. Some were tied to one of the ENR cost indexes. Bids taken two ways last year—with and without an escalation clause tied to the ENR building cost index, and BLS wage rates—showed an 8% saving with the escalation. The job was Berks County Home and Hospital in Pennsylvania. The architects, Muhlenberg, Yerkes & Muhlenberg report that through August this year, with the job 55% completed, the escalation is less than 2% on the total contract price of $2,750,000.

• **Cost of money is higher**—The price of renting money to finance construction has gone up since January and February when it was the lowest for the year and the lowest since 1946 for public works.

Yields on municipal bonds averaged 1.61% in February, then went up to 2.22% in June and backed down to 2.05% in September. Their 1946 low was 1.45% in April.

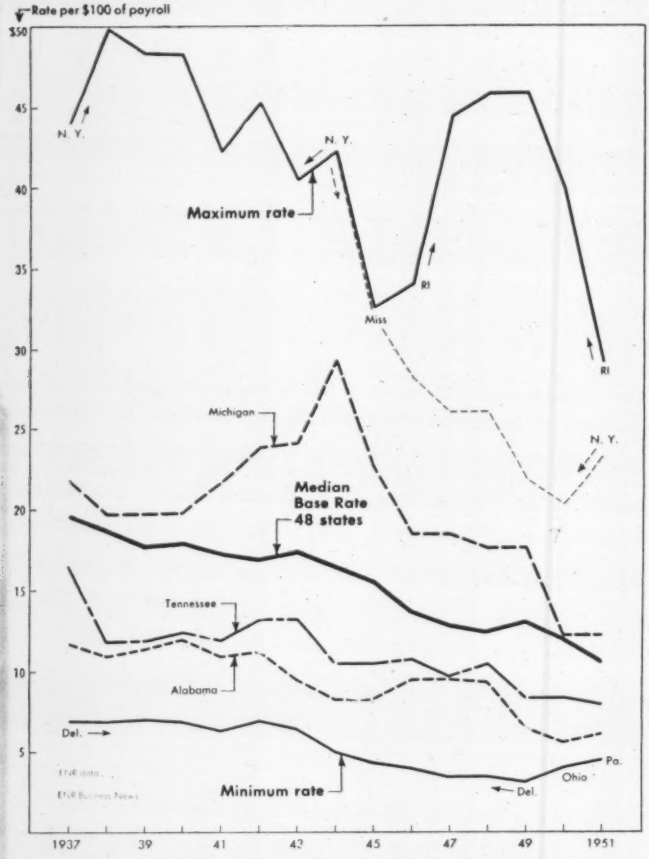
Industrial, utility and railroad bond prices were more stable but climbing slowly. Industrial bond yields were 2.53% in January, moved up to 2.80% in July and backed down to 2.69% in September. These compare with a postwar low of 2.36% in March, 1946.

Public utility borrowers paid 2.64% in January, 2.99% in July and 2.88% in September. These are up from a low of 2.40% in March, 1946.

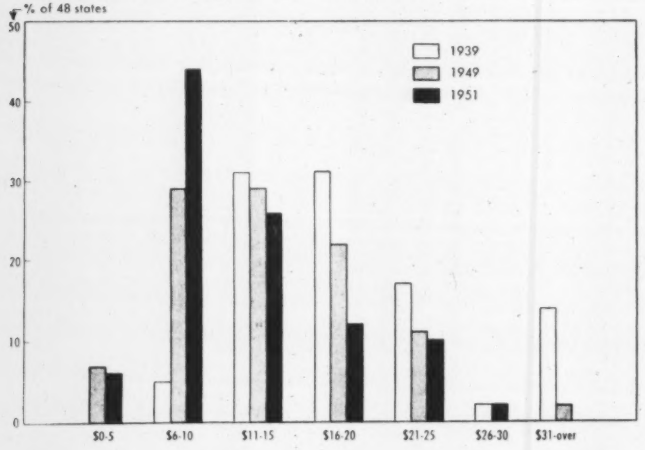
Railroad bond yields were 2.68% in February, 2.98% in July and 2.88% in September. These are up from a low of 2.52 in April, 1946.

• **Outlook**—The evidence at hand indicates that the rate has been slowed at which construction costs are rising since Korea turned them loose again. But the inching and creeping up will continue, due mainly to wage rate increments. Wage increases expected in the steel industry will probably push steel prices up around the first of 1952, and they will be passed on to push up construction costs. But these always-present pressures should not push construction costs beyond a 5 percent rise in the next six to nine months when some relief is hoped for from an expanded steel supply. This outside 5% limit, of course, refers to wages and prices together. It does not consider the adverse effect on construction selling prices of losses in productivity due to shortages, substitutions, emergency speedups, and special conditions on individual jobs.

1 Compensation insurance rates have gone down for structural steel erection



2 This shift to lower steel erection rates — showing percent of states in each base rate range for each of three selected years



Compensation

Construction safety programs are paying 2-way cash dividends, lower insurance premium payments by contractors, higher cash benefits and fewer accidents to workers.

In the face of rising costs almost everywhere else, compensation insurance premiums are down at least 24.2% across the board since 1939, and as much as 47% for structural steel erection. With the maximum base rate on structural steel erection at $50 per $100 of payroll in 1938 and only $29 in February 1951 this is a substantial saving in "overhead". Actually New York state contractors reduced their structural steel erection base rate from $50 per $100 in 1938 to $20.28 in 1950 and saw the title to the highest rate in the country pass to Rhode Island, $39.84 in 1950. In 1951 the New York rate went up to $23.17 and the Rhode Island rate came down to $28.97, still the nation's highest.

Responsible for these large gains is a fine record of reducing the number of compensation cases per $1 million of construction payroll. That premiums are not reduced even more than they have been is due in part to legislation throughout the country increasing benefits to injured workers.

But, in spite of spectacular reductions in its premiums, construction still pays over twice as much for its compensation insurance as do manufacturers. The reason, of course, is that indemnity costs are still high on construction cases and construction still has more cases.

From facts supplied by the National Council on Compensation Insurance, the Association of Casualty and Surety Companies and national tables of base rates in each state on the principal construction operations, which have been published by ENGINEERING NEWS-RECORD annually since 1937, the accompanying diagrams show graphically how much costs are down, how much cases have been reduced, and how much higher benefits are.

For the most part base rates have been lowered throughout the country. But a study of five of the most hazardous operations, hence the highest rates show increases this year in 11 states for structural steel erection, in 12 states for general concreting, in 8 states for rock excavation, in 4 for roofing and in 7 for wrecking. These states with higher rates for all five classes of construction are Arizona and Massachusetts.

Where these hazardous base rates were reduced, the wrecking rate has been reduced most. From 1937 to '51

insurance rates go down as benefits go up

this rate has been cut 50% or more in 28 states. Structural steel base rate has been cut 50% or more in 21 states, rock excavation in 20 states, roofing 50% or more in 14 states.

Since the war, from 1946 to '51, rate cuts have been greatest on general concrete work, 25% or more in each of 20 states. Wrecking and steel erection rates in these 5 years have gone down 25% or more in 18 states, roofing in 17 states, rock excavation rates are down in only 8 states.

From 1950 to '51, base rates dropped 10% or more on roofing in 24 states, on wrecking in 22 states, on general concreting in 19 states and on rock excavation in 18 states, on steel erection in 16 states.

So much for effect. To examine cause the National Council on Compensation Insurance has made construction experience records available for three states, Michigan, Tennessee and Alabama. Judging by structural steel erection rates, Michigan is just above the median for all states and Tennessee and Alabama are a little below. These show, chart 3, that it is the reduction in number of cases that has brought the premiums down. Since the average indemnity is rising they show also that further major reductions in premiums will probably have to come from a reduction in severity of accidents, thus in a reduction in average indemnity per case.

Although the trend is toward mandatory higher benefits, construction still has room for improving both its number of cases per $1 million and its indemnity per case, if the records achieved by manufacturers can be used as a base of comparison, chart 4.

Table I—Base rates have increased in a few states while they went down in most—analysis for 5 of most hazardous operations

	Number of states* having					
	Decrease			Increase		
Type of work	'37-51	'46-51	'50-51	'37-51	'46-51	'50-51
Structural steel	43	35	28	3	7	11
General concrete	a	39	26	a	3	12
Rock excavation	40	30	27	2	12	8
Roofing	38	37	33	2	4	4
Wrecking	41	35	30	2	3	7

a This rate not available for 1937.

* Includes District of Columbia. Rate data for some states not available for certain years.

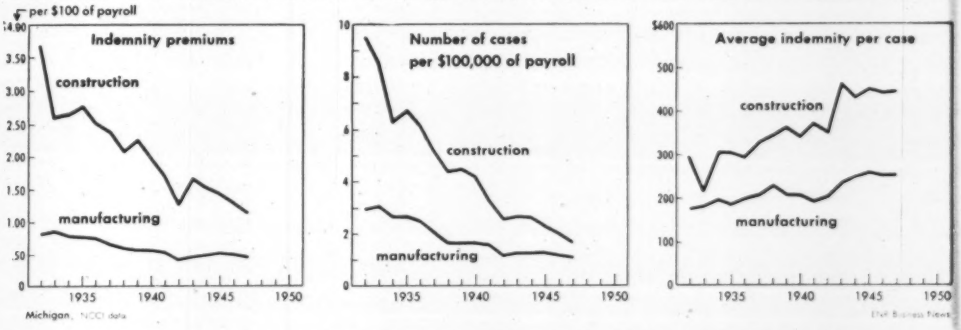
• **Increased benefits**—In 1951 to date 43 state legislatures have amended their workmen's compensation laws and, of these, 36 increased benefits. A few states are still in session and additional increases are expected, particularly in Pennsylvania. These amendments follow changes by 41 states in 1949 in which 32 states increased benefits.

These increased benefits obviously resulted in increased premiums which ranged throughout industry from 5% to more than 50%. Chart 5 shows, in index form, that base rates in the countrywide manual in 1950 would have declined 40.3% without the 1949 amendments and that they did, in fact, decline 24.2% from 1939 in spite of the costs of increased benefits.

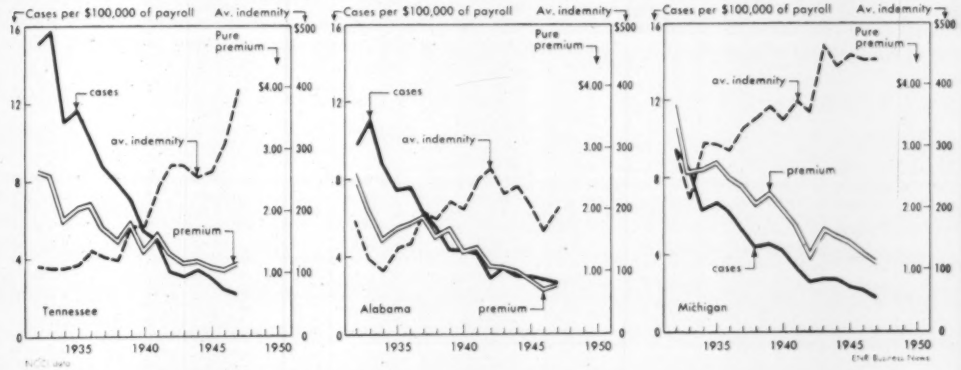
In 1950 four states increased benefits ranging from 11% in Kentucky to 1.2% in Rhode Island. States having monopolistic state compensation insurance are not covered in this analysis.

To date in 1951 27 states have increased compensation benefits ranging from 20.1% in New Mexico to 0.2% in Massachusetts. And the

3 Construction has reduced its insurance costs rapidly, but they are still more than double the cost to manufacturers



4 Construction compensation insurance cases and premium payments go down while payments per case go up



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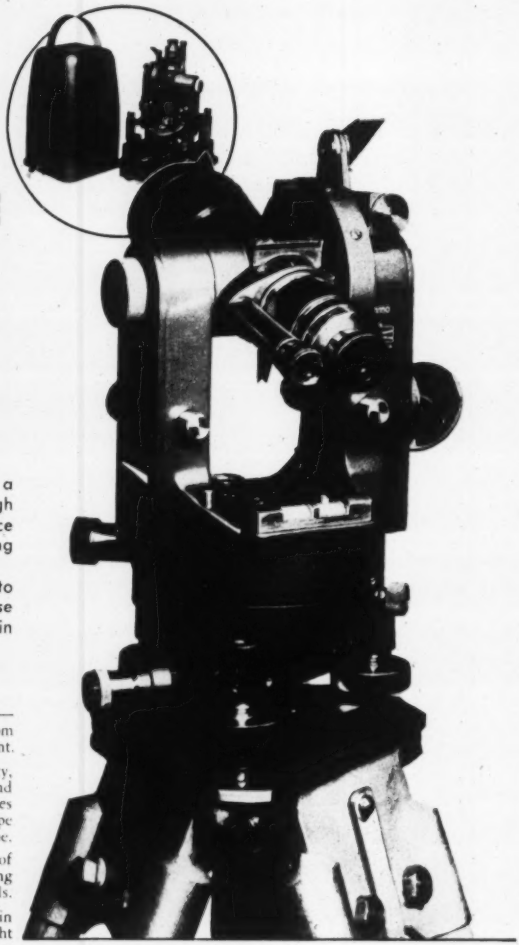

The F-S Model 4150R OPTICAL THEODOLITE is a classic example of the progress achieved through Filotecnica Salmoiraghi's long and wide experience in the production of precision-engineered surveying instruments.

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Special features include the:

F-S OPTICAL PLUMMET—which eliminates plumb bob—and the constant delay and annoyance resulting from swing and wind displacement.

F-S OPTICAL READING SYSTEM—which insures accuracy, relieves eye-strain and eliminates parallax errors and verniers. Reading of both vertical and horizontal circles are taken, at a glance, to 6" through the microscope eye-piece next to the telescope.

F-S REPEATING LEVER—which speeds repetition of angles and prevents errors and confusion by eliminating one set of horizontal controls.

F-S ILLUMINATING SYSTEM—which reduces eye-strain and provides luminous clarity of reading scales for all daylight conditions. Special Battery Lamp for work in tunnels and mines.

F-S INTERNAL FOCUSING TELESCOPE combines 29 power magnification and finest optical properties with convenient shortness. Has rifle sights—both direct and reverse.

F-S FULL "BEHIND-INSTRUMENT" OPERATION. Once the tripod is set up, all operations from the first leveling to the final readings, are controlled from the operator's position *behind the instrument.*

The F-S Model 4150R is conveniently light and compact. It weighs only 9 lbs. 14 oz. and stands 10" high. This precision-engineered instrument—including special Tripod and lightweight aluminum alloy Carrying Case, sells for $650.00.

Special Accessories include: Striding Compass, Telescope Level, Optical Distance Measuring Device, Traverse Sight and Eyepiece Prisms for Steep Slope Sights.

The salient feature of the F-S Optical Theodolite is the utilization of optical glass circles, graduated by diamond-point engines with lines of microscopic fineness. A special mirror directs light into the optical system. This light, automatically led by a train of prisms and lenses, takes shots of both the horizontal and vertical circles and carries them to the microscopic eyepiece next to the telescope. The exceptional precision of circle graduation, together with the high magnification of the reading scales, makes possible an accurate reading to 6 seconds on a circle of only 3½ inches in diameter.

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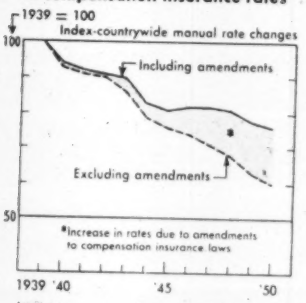
5 Increased benefits slow reduction in compensation insurance rates



Oklahoma Legislature has included fatal benefits in the Compensation Law making $13,500 payable in a lump sum to dependents.

In addition to the purely statutory provisions of the law the question of interpretation either by administrative authorities or by the courts is of great importance. These involve questions of causal relationship between the injury and the disability, what constitutes an accident, whether the injury was actually a "work injury."

As to the nature of these benefits:

In Rhode Island a non-occupational disability law is in effect under a monopolistic state fund, in addition to the workmen's compensation law. In that state, compensation is payable under the disability law for injuries, even though the injury is compensable under the workmen's compensation law. Thus, at least in the lower wage groups, compensation under both acts has exceeded the amount earned when working. The law, however, has been amended so that it now provides that compensation under both acts shall not exceed 85% of average weekly earnings.

Table II—Range of Workmen's Compensation Benefits in the U. S.—Jan. 1, 1950

Type of Benefit	Maximum	Minimum
Fatal injuries		
Maximum period, wks	600 RI(a)	260 Vt
Widow only, max wk	$80.77 Ariz	$11.54 W. Va
Widow & children, max wk	$153.69 Ariz	$15.60 Idaho
Widow only, max amt	$12,000 Mo(b)	$4,500 Pa
Widow & children, max amt	$13,000 Mont(a)	$5,000 Kan
Widow only, min wk	$20.19 Wyo	$3.00 La
% of wages, max	90% Nev	50% 4 sts
Widow only, % of wages	66⅔% (c)	30% Del
One child only, % of wages	66⅔% (c)	15% Miss
Permanent total disability benefits		
Maximum period, wks	1,000 RI(d)	260 Vt
Wkly payment, max	$150.00 Ariz	$17.00 Idaho(e)
Wkly payment, min	$20.19 Wyo	$3.00 La
Max amount	$25,500 Mich(d)	$6,000 NC, SC
% of wages, max	70% Nev, Wis	50% 4 sts
Temporary total disability benefits		
Maximum period, wks	1,000 RI(f)	156 WVa
Wkly payment, max	$150.00 Ariz	$17.00 Idaho(e
Wkly payment, min	$21.92 Ore	$3.00 La
Max amount	$65,000 Ariz(f)	$3,900 W Va
% of wages, max	66⅔% 19 sts	50% 4 sts

Maximum amounts payable for scheduled injuries

Temporary disability allowance plus permanent partial disability benefits—25 states & D. C.		
Arm at shoulder	$16,265 Wis	$3,300 Ariz
Hand	13,020 Wis	2,370 Colo
Thumb	4,070 Wis	405 Wyo
1st finger	1,955 Wis	376 Wyo
2nd finger	1,465 Wis	290 Wyo
3rd finger	847 Wis	251 Colo
4th finger	912 Wis	160 Wah
Leg at hip	16,265 Wis	2,750 Ariz
Foot	8,133 Wis	2,080 Wyo
Great toe	2,710 Wis	260 Wyo
Other toes	416 Conn	138 Ariz
One eye	8,130 Wis	1,650 Ariz
Hearing, 1 ear	2,400 Ore	600 Me
Hearing, 2 ears	10,832 Wis	1,560 Me

Temporary disability allowance plus permanent partial disability benefits for limited period—12 states		
Arm at shoulder	$9,984 NY	$3,600 Ky
Hand	7,808 NY	2,700 Ky
Thumb	2,400 NY	1,000 Vt
1st finger	1,472 NY	625 Vt
2nd finger	1,100 Ill	500 Vt
3rd finger	800 NY	360 Ky
4th finger	600 Ill	250 Vt
Leg at hip	9,216 NY	3,600 Ky
Foot	6,560 NY	2,250 Ky
Great toe	1,382 Ind	500 Vt
Other toes	512 NY	180 Ky
One eye	5,120 NY	1,800 Ky
Hearing, 1 ear	1,920 NY	500 Kan
Hearing, 2 ears	5,100 NH	2,000 Kan

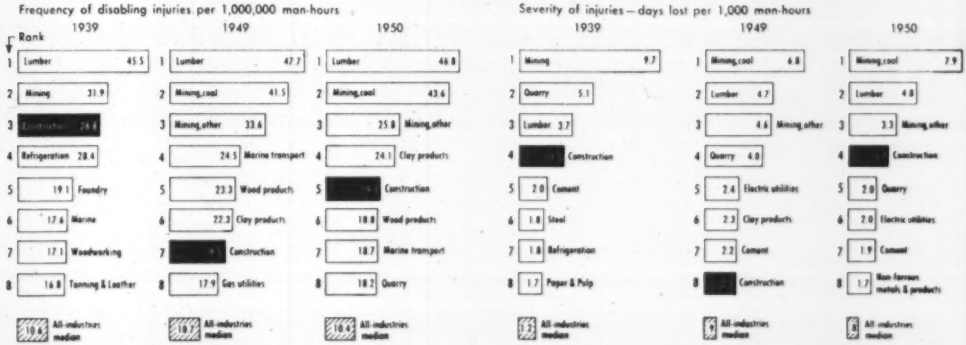
Temporary disability allowance deducted from permanent partial disability benefits—11 states		
Arm at shoulder	8,500 Mich	4,000 Va
Hand	6,800 Mich	3,000 Va
Thumb	2,040 Mich	960 La
1st finger	1,190 Mich	700 Va
2nd finger	1,020 Mich	600 Ia, La, Va
3rd finger	875 Mo	400 Va
4th finger	600 La	300 Va
Leg at hip	6,800 Mich	3,500 Va
Foot	5,100 Mich	2,500 Va
Great toe	1,040 Mich	600 Ia, La, Va
Other toes	400 W.Va, Pa	200 Va
One eye	5,100 Mich	2,000 Va
Hearing, 1 ear	3,000 Okla,La,Ala	720 Ia
Hearing, 2 ears	4,200 Mo	3,000 La,Okla, Tex

a) No limit in: Ariz, Calif, D C, Ill, Kans, Minn, Mo, Nev N Y, N D, Ore, S D, Wash, W Va, Wyo
b) No limit in: Ariz, D C, Nev, N Y, N D, Ore, Wash, W Va
c) Me, Md, Mich, Mo, Neb, N H, Ohio
d) Life period in: Ariz, Calif, Colo, Del, D C, Ida, Mass, Neb, Nev, N J, N Y, N D, Ohio, Ore, S D, Wash, W Va, Wis
e) Maximum $20 married, widowed or divorced, plus $2 ea child, maximum $28
f) Length of disability in: Colo, Del, D C, Ida, Ill, Mass, N Y, N D, Ore, Wash, Wis, Wyo

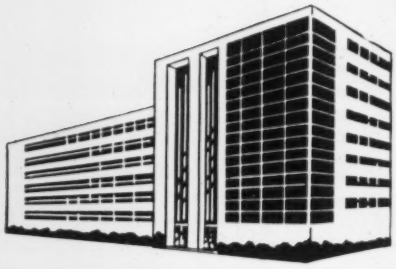
Benefits are being increased by 1951 legislation but details are not yet available for this type of analysis.

In Massachusetts the maximum weekly compensation for disability is $30.00 a week, but in addition thereto, $2.50 is payable for each total dependent up to 100% of the average weekly wage. Subject to these limits, compensation for total disability is payable at the rate of 66⅔% of average weekly wages and for partial disability 100% of the average loss of earning power. It can easily be appreciated that, under these provisions, employees are in a position to receive, especially if they have fairly large families, 100% of their average wages. In addition, the benefits provided in the schedule for permanent partial disability, that is, loss of members, etc., are not exclusive and are payable in addition to any other benefits. Compensation under this schedule provides for payment of $20.00 weekly, regardless of the prior wage, for a period ranging from 100 to 500 weeks. Thus, if an employee suffers a loss of a member he is paid compensation pursuant to this schedule, but if he has any loss in earning he is paid additional compensation for such loss. In most other states, benefits in the schedule are in lieu of other benefits for that injury, except in a number

6 From the 3rd and 4th worst injury records in 1939, construction moved to 7th and 8th places in 1949 due in part to subdividing other hazardous industries . . . But in 1950 construction backed up to 5th and 4th places.



MISSISSIPPI WIRE GLASS helps...



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of jurisdictions, an additional amount is payable for a healing period. There is an overall maximum of $10,000.00 for partial disability and temporary total, but compensation for permanent total disability is payable during such disability, that is, in effect usually for life.

• **More benefits**—Other extreme examples of generous benefits include:

In Arizona, there is virtually no limit on the amount of weekly compensation, other than the provision adopted in 1948, that wages in excess of $1,000.00 a month shall not be taken into consideration in computing the amount of compensation. Of course, compensation is payable at a percentage of wages. The State Fund in that state, which writes a very large percentage of the business in that state because of unfair competitive provisions contained in the law, has experienced serious financial difficulties and has had to make very substantial increases in its rates. An initiative petition failed to pass in 1950 providing that wages in excess of $300.00 a month will not be taken into consideration in computing compensation and also placing an overall limit of $25,000.00 in death cases. Also another initiative petition which used the same figures but provided that they shall be minimum limits rather than maximum was disqualified for failure to contain sufficient valid signatures.

In Louisiana, through court decision, compensation is payable as for total permanent disability in cases of permanent partial injury where the employee is unable to return to the same employment because of such injury. This is not clearly set out in the law, but the courts were so construing the statute. Thus, compensation has been paid in case of injuries where employees have been able to secure other work at wages equal to or even greater than those they were earning at the time of the injury and such compensation has been paid as if they were permanently and totally disabled. This has produced an undesirable result, as, for example, in case of hernia where employees have refused to undergo operations and, therefore, were unable to do heavy physical work, even though they were able to perform duties not requiring severe physical effort.

In South Carolina, compensation for disfigurement is payable even for injuries covered by schedule of compensation for permanent partial disability. It is also specifically provided that in case of bodily disfigurement it shall not be necessary for the employee to prove that disfigurement handicaps him from retaining or procuring employment or that it interferes with his earning capacity. There is a maximum payment of $2,500.00 for disfigurement, but this provision has been very broadly construed and some award for disfigurement is made in a great number of cases where no disfigurement in the usual sense of that word exists. Recently, for example, there was a case where an award was made for disfigurement in a fairly substantial amount for an injury involving a back strain.

Indemnity benefits payable vary from state to state through an extreme range. For example, as of Jan. 1, 1951 maximum death benefits payable to widow and children ranges from no limit in 8 states, $13,000 in Missouri down to $5,000 in Kansas, and $4,500 (for widow only) in Pennsylvania. Loss of leg at hip pays $16,265 in Wisconsin, $3,465 in Wyoming. Table II shows this high-low range for major benefits.

With continuing pressure for increased benefits, especially in the present lower brackets, the down trend in compensation insurance rates could be slowed and even reversed unless construction safety programs continue to reduce not only the number of compensation cases but also their severity.

• **Safety records**—Construction cut its injury frequency rate 36% in ten years, from 28.81 injuries per 1,000,000 man hours in 1939 to 19.48 in 1949, the National Safety Council reports, then again in 1950 to 19.34.

It cut its injury severity rate 32%, from 3.14 days lost per 1,000 man hours in 1939 to 2.15 days lost in 1949. But in 1950 this severity rate went up to 2.75 days lost per Mmh.

In spite of this improvement, however, construction's injury frequency rate in 1949 was the 7th highest out of 40 industries and its severity rate 8th highest. Only lumber, mining, quarries, marine transport, clay products, and cement are higher.

In 1950 construction backed up to the 5th highest frequency rate and the 4th highest severity rate, with only lumber, mining, clay products and cement making a worse showing.

A special study of 4,443 selected construction companies in 1949 by the Bu. of Labor Statistics established a high frequency rate of 39.8 and a severity rate of 100 days lost.

Highway and street construction contractors had the worst work injury frequency rate, 41.8 in 1949, according to this study, the most recent data released by the BLS. But heavy construction contractors on other than highway work had the worst severity rating, 132. Structural steel erection and ornamental iron work together got a 48.6 frequency rating and 279 average days lost. Only logging produced a worse severity rating.

Building costs by types

How much building you can buy for today's dollars is shown by working ranges in building costs for 24 types of buildings reported here by nine contractors covering structures in 26 cities and 8 states.

Boiler houses and banks cost most per square foot, $40 and $36 respectively. Hotels, clubs, health centers, banks, school dormitories cost the most per cubic foot, all more than $2.

Massachusetts, 1950–'51

reported by Daniel Cunningham Constr. Co., Inc., Boston, Mass.

Location	Type of bldg	Mech incl in addn to p,h,e	Date	Cost per sq ft	Cost per cu ft
Winchester	hospital	s,el,v,r,a	1/51	$23.50	$1.67
Woburn	hospital	s,el,v,r,a	3/51	21.50	1.70
Lowell	hospital	s,el,v,r,a	5/51	24.00	1.71
Woburn	warehouse	s	9/50	6.10	0.66
Framingham	loading dock (assem plant)	...	3/50	5.60	0.69
Amherst	laboratory	el,v	1/50	19.00	1.36
Amherst	dormitory	el	1/50	16.00	1.03

Maryland, 1949–'50–'51

reported by Mulian Contracting Co., Baltimore, Md.

Balto County	pub sch bldg	v	2/51	$19.18	$1.50
Sykesville	mental hosp(2)	v	7/50	12.27	1.85
Annapolis	court house	v,el,a,s	7/49	15.89	1.31

Kentucky, 1951

reported by F. W. Owens Co., Inc., Louisville, Ky.

Louisville	warehouse	...	4/51	$7.75	$0.475
Louisville	bus rep garage	...	8/51	13.30	0.79
Louisville	dept store	s, no h	1/51	8.80	0.60
Louisville	branch bank	a	3/51	31.75	1.66

Kansas, 1951

reported by Busboom & Rauk, Salina, Kansas

Abilene	office	no mech	7/51	$6.00	$0.50
Menter	school	...	7/51	11.20	0.93
Wilmore	school	...	7/51	10.80	0.82

Tennessee, 1946–'48–'49–'51

reported by V. L. Nicholson Co., Knoxville, Tenn.

Lake City	pub high sch	v,r	4/51	$9.92	$0.83
Clinton	office bldg	...	1/51	6.92	0.57
Knoxville	office bldg	el	4/51	24.86	1.85
Claiborne Co.	pub high sch	...	4/49	8.32	0.64
Church Hill	bank	...	4/48	13.65	1.07
Knoxville	pub high sch	...	10/48	8.04	0.67
Knoxville	dormitory(3)	el	10/48	13.19	1.00

North Carolina, 1950–'51

reported by Southeastern Construction Co., Charlotte, N. C.

Charlotte	gym & assem'ly	no mech	7/51	$11.46	$0.87
Raleigh	student activ	no mech	6/51	12.79	1.02
Charlotte	mfg plant	no mech	6/51	5.80	0.288
Charlotte	mfg plant	no mech	8/50	4.21	0.19
Raleigh	school	no mech	11/50	*10.02	0.83
Winston Salem	lab	no mech	...	16.28	1.16

Western Pennsylvania, 1951

reported by The Trimble Co., Pittsburgh, Pa.

Bridgeville	off bldg addn	el	8/51	$21.66	$1.94
Ambridge	paymastr & cloak rm bldg	v,a	7/51	18.10	1.47
Ambridge	office bldg	...	7/51	14.00	1.22
Pittsburgh	off & whse	v	7/51	9.68	0.89
Pittsburgh	lt mfg bldg addn	...	8/51	10.11	0.58

all building costs include p,h,e—except as noted
p—plumbing, h—heating, e—electrical, s—sprinkler, el—elevator, v—ventilating, r—refrig, a—air conditioning

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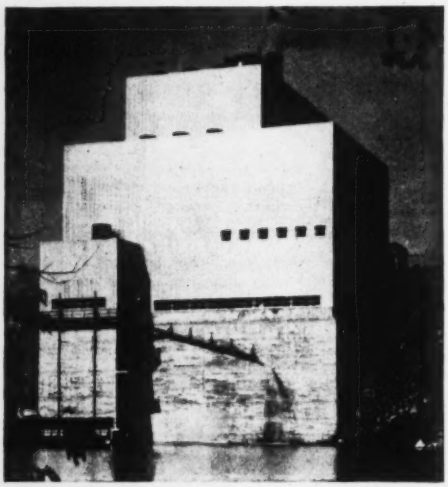
Q-PANELS

Northern Virginia Power Co., Riverton, Va.
Designed and built by Sanderson & Porter, Inc. Chapman, Evans & Delahanty, Associate Architects.



Every feature of a Q-Panel is a desirable feature for powerhouse construction . . . which explains why Q-Panels have captured the powerhouse market.

Q-Panels go up fast—50 sq. ft. in 9 minutes. A small crew quickly attaches the panel to the steel framework. Little blocks don't pile up fast. *It's much quicker to hang a wall than to pile it up.*

Q-Panels provide a maintenance-free exterior; they are available in a variety of materials for exterior finishes, depending on their availability at time of ordering.

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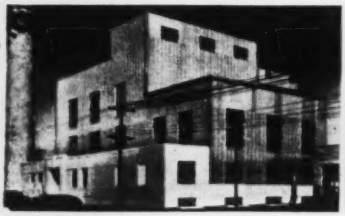
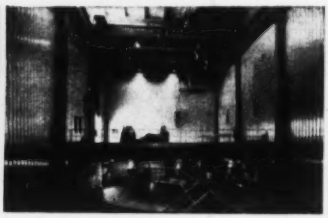
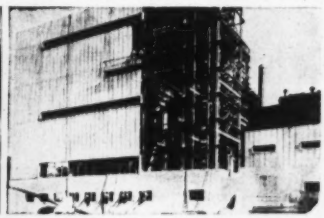


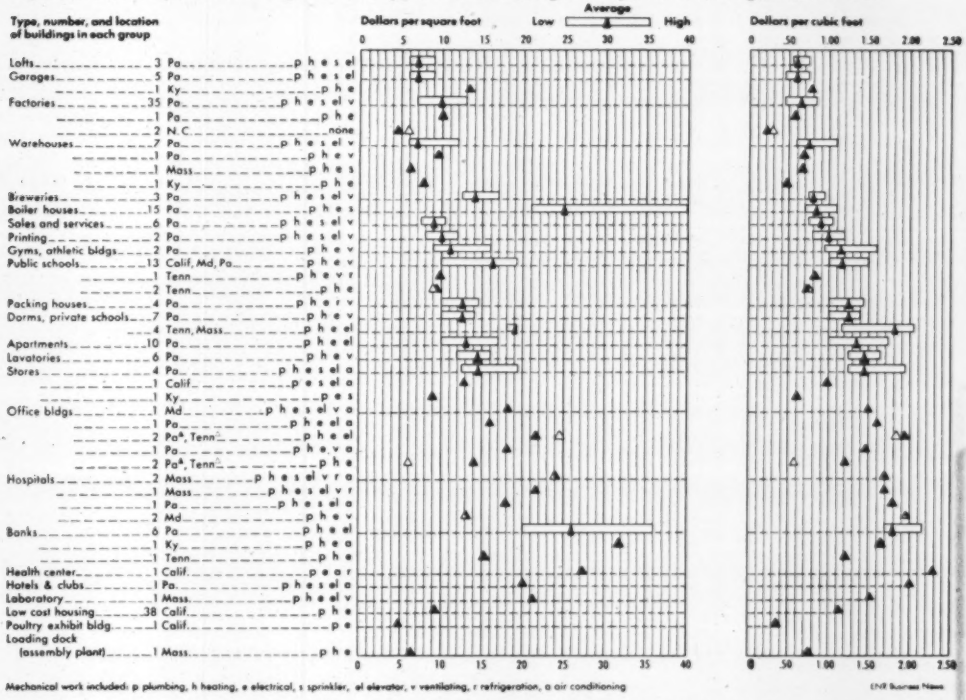
Tennessee Valley Authority Watauga Project
Elizabethton, Tenn.



Note clean, quick, dry, safe, curtain-wall construction.



Square and cube cost range for 24 types of buildings – adjusted to July, 1951 Costs


Type, number, and location of buildings in each group
Dollars per square foot
Low
Average
High
Dollars per cubic foot
Lofts 3 Pa p h e s el
Garages 5 Pa p h e s el
1 Ky p h e
Factories 35 Pa p h e s el v
1 Pa p h e
2 N.C. none
Warehouses 7 Pa p h e s el v
1 Pa p h e v
1 Mass p h e s
1 Ky p h e
Breweries 3 Pa p h e s el v
Boiler houses 15 Pa p h e s
Sales and services 6 Pa p h e s el v
Printing 2 Pa p h e s el v
Gyms, athletic bldgs 2 Pa p h e v
Public schools 13 Calif, Md, Pa p h e v
1 Tenn p h e v r
2 Tenn p h e
Packing houses 4 Pa p h e r v
Dorms, private schools 7 Pa p h e v
4 Tenn, Mass p h e el
Apartments 10 Pa p h e el
Lavatories 6 Pa p h e v
Stores 4 Pa p h e s el a
1 Calif p e s el a
1 Ky p e s
Office bldgs 1 Md p h e s el v a
1 Pa p h e el a
2 Pa[a], Tenn p h e el
1 Pa p h e v a
2 Pa[a], Tenn p h e
Hospitals 2 Mass p h e s el v r a
1 Mass p h e s el v r
1 Pa p h e s el a
2 Md p h e v
Banks 6 Pa p h e el
1 Ky p h e a
1 Tenn p h e
Health center 1 Calif p e a r
Hotels & clubs 1 Pa p h e s el a
Laboratory 1 Mass p h e el v
Low cost housing 38 Calif p h e
Poultry exhibit bldg 1 Calif p e
Loading dock (assembly plant) 1 Mass p h e
0 5 10 15 20 25 30 35 40
0 .50 1.00 1.50 2.00 2.50

Mechanical work included: p plumbing, h heating, e electrical, s sprinkler, el elevator, v ventilating, r refrigeration, a air conditioning

ENR Bureau News

BUILDING COSTS, grouped by types of structures, are adjusted on this chart from the dates shown in the accompanying tables to July, 1951 costs by applying the ENR Building Cost Index. The bars show range of costs where several similar buildings are included. The triangles show costs of single units, or, within the bars, the average cost for the group.

In the lower cost ranges a poultry exhibition building in Fresno, Calif., with no heating required, takes the low both for square foot cost, $4.75, and for cubic foot cost, $0.368.

You can buy loft buildings and garages in Pennsylvania for $6-9 a sq ft and $0.45-0.75 a cubic foot, one in Louisville cost $13.29 a sq ft and $0.78 a cu ft.

Pennsylvania factories range from $7-13 on a floor area basis, $0.45-0.85 on cubic measurement. In North Carolina, not counting in any mechanical costs for heating, plumbing or electricity, factory costs ran $4.63-5.88 per sq ft and $0.21-0.29 per cu ft.

Schools range from $9.01 to $19.20 per sq ft and from $0.73-1.50 per cu ft.

Low cost housing is around $9.39 per sq ft and $1.14 per cu ft in California while apartment houses in Pennsylvania run from $10-17 per sq ft and from $1-1.75 per cu ft.

These figures are quoted from the chart where all prices as reported have been adjusted to July 1, 1951 wage and price positions. The tables show prices and dates as reported by building contractors.

Building costs in 26 cities and 8 states

Philadelphia and vicinity, adjusted to July 1, 1951

reported by John A. Robbins Co., Inc., general contractors, Philadelphia, Pa.

Type of building	No.	Mech wk incl in addn to p,h,e	Date	Cost per sq ft high	Cost per sq ft aver	Cost per sq ft low	Cost per cu ft high	Cost per cu ft aver	Cost per cu ft low
Apartments	10	el	7/1/51	$17.00	$13.00	$10.00	$1.75	$1.35	$1.00
Banks	6	el	7/1/51	36.00	26.00	20.00	2.15	1.80	1.70
Boiler houses	15	s	7/1/51	40.00	25.00	21.00	1.10	0.85	0.70
Breweries, etc.	3	s,el,v	7/1/51	17.00	14.00	12.50	0.95	0.80	0.75
Dorms & priv schools	7	v	7/1/51	14.00	12.50	10.00	1.40	1.25	1.00
Factories	35	s,el,v	7/1/51	13.00	10.00	7.00	0.85	0.65	0.45
Garages	5	s,el	7/1/51	9.00	7.00	6.00	0.75	0.60	0.45
Gym & athletics	2	v	7/1/51	16.00	11.00	9.00	1.60	1.15	0.95
Hospitals	1	el,a,s	7/1/51	22.50	18.00	15.00	2.25	1.80	1.50
Hotels & clubs	1	el,a,s	7/1/51	26.00	20.00	16.00	2.60	2.00	1.60
Lavatories	6	v	7/1/51	16.00	14.50	12.00	1.65	1.45	1.25
Lofts	3	s,el,v	7/1/51	9.00	7.00	6.00	0.75	0.60	0.55
Office bldg	1	el,a	7/1/51	23.00	16.00	11.00	2.30	1.60	1.10
Packing houses	4	r,v	7/1/51	14.50	12.50	10.00	1.45	1.25	1.00
Printing	2	s,el,v	7/1/51	12.00	10.00	8.00	1.20	1.00	0.80
Public schools	1	v	7/1/51	14.00	12.00	10.00	1.35	1.20	1.00
Sales, service	6	s,el,v	7/1/51	10.50	9.00	7.50	1.05	0.90	0.75
Stores	4	s,el,a	7/1/51	19.50	14.50	12.50	1.95	1.45	1.25
Warehouses	7	s,el,v	7/1/51	12.00	7.00	6.00	1.10	0.75	0.60

Fresno, Calif., Jan. to June, 1951

reported by Harris Construction Co., Inc., building contractors, Fresno, Calif.

Poultry exhib bldg	1	no h	Jan	$4.92	$4.66	$4.34	$0.408	$0.361	$0.337
Jr. high school	4	v	May	17.58	16.88	16.18	1.09	1.05	1.01
Element school	7	v	June	16.51	15.99	15.46	1.21	1.18	1.14
Depart store	1	s,s,el, no h	May	13.26	12.87	12.48	1.02	0.99	0.96
Health center	1	s,r,no h	May	28.88	27.40	25.92	2.32	2.28	2.23
Low cost housing	38	.....	June	9.48	9.40	9.32	1.15	1.14	1.12

Note: Health center includes laboratory furniture and equipment
Housing project includes landscaping and paving
All buildings include p,h,e—except as noted
p—plumbing, h—heating, e—electrical, s—sprinkler, el—elevator, v—ventilating, r—refrigeration, a—air conditioning

—See also tables on preceding page

Four Americans—Eight Nationals
on an Engineering Project!

What a complex insurance situation *this* creates, as they move through hazardous terrain in a foreign country!

First their American employer must consider his responsibility under Workmen's Compensation laws. If an accident happens, medical, surgical, hospital bills, weekly indemnities and scheduled lump-sum awards may prove to be a staggering blow. These are the laws with which the employer may be involved:

(a) Laws of Employer's State
(b) Laws of His Employees' States
(c) Laws of the Nationals' Countries
(d) Laws of Foreign Country Where Accident Occurs

But that isn't all. The employer's automobile must be covered to conform to the strict liability laws of foreign countries. General public liability insurance also may be required.

Then if sound business practices are followed, his equipment, instruments and other properties should be protected by insurance.

Whatever your foreign operations entail—property, machinery, raw materials, finished goods—sound American insurance protection can be provided through the American Foreign Insurance Association—protection that will fit your problem and will conform to the complexities of foreign laws.

The international know-how and world-wide facilities of AFIA are available to you through your local agent or broker. See him!

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COMPLETE INSURANCE COVERAGE IN FOREIGN LANDS

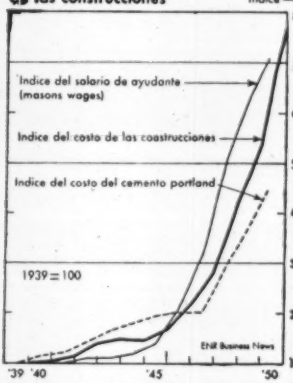
Foreign construction costs rise, too

Contractors in the USA are not alone in their problems of coping with higher construction materials prices, with higher wages, with social charges and insurance added to direct labor costs, and with shortages. These are all fairly universal construction headaches.

The accompanying report on prices and wages in 26 countries is the second world-wide round-up of construction costs made for ENGINEERING NEWS-RECORD by resident reporters for McGraw-Hill World News.

Skilled labor shortages exist in France, in Puerto Rico, in Egypt and in Australia where the shortage is acute.

Buenos Aires, Argentina
Número índice del costo de las construcciones



Source: Construcciones, published by Camara Argentina de la Construccion

Construction cost index in Argentina

A new construction cost index for Buenos Aires, Argentina, issued by CONSTRUCCIONES, the official monthly magazine of the Camara Argentina de la Construccion, has been launched with this introduction:

"Adoptando una fórmula similar a la empleada por la revista 'Engineering News Record', para estimar las variaciones de costo de las construcciones en Estados Unidos, se ha venido dando en los Nos. 36, 45, 53 y 61 de esta revista los numeros indices del costo de los edificios en la Capital Federal."

The base used in this index is 1939 = 100. Five elements are repriced monthly to establish new values. The index and two of its five elements, labor and cement, are shown in the accompanying chart.

Weightings for each of the five elements are:

56.7	hrs mason or bricklayers labor, incl. social charges and insurance
4.39	bags portland cement
2.32	m³ lumber (0.025m thick) Parana pine or spruce
16.6	Kg reinf. iron rods, 10mm dia
0.682	m³ sand (coarse)

Labor notes

Wage rates reported here are assembled for ENGINEERING NEWS-RECORD by McGraw-Hill World News resident reporters who have also supplied the following notes on conditions in the countries they represent.

● **Mexico City, Mex.**—Labor unions have dropped the classification of "peons second class" and with it the 62 centavos rate. Now all peons or all ordinary laborers get 75 centavos per hour.

● **San Juan, Puerto Rico**—A shortage of skilled labor for construction is due to the large number of these workers that has migrated to factories and construction jobs on the U. S. mainland.

● **Rio de Janeiro, Brazil**—All wages are up 1%. The Government cost of living index is up 11%.

● **Madrid, Spain**—All general wages in Spain were increased 20 to 25% in 1950 with no changes in 1951, except government workers whose increases came in 1951.

● **Paris**—France needs at least 150,000 additional skilled building trades workers, with the shortage of masons most acute. At least 100,000 masons are needed, almost as many as are now employed. 10,000 more carpenters, 15,000 more plumbers, 10,000 cabinetmakers, 10,000 ironworkers and 5,000 to 15,000 skilled workers in other building trades are needed. The Council of the Republic's committe on apprenticeship reports these shortages and warns that it may be necessary to reduce the planned reconstruction program or to import qualified foreign labor if government and private employers do not succeed in enlisting larger numbers for the required 3-year apprenticeships.

● **Cairo, Egypt**—Wages have increased on all categories of workmen due to the increasing high cost of living and shortage of skilled labor.

● **Bombay, India**—Labor continues plentiful, materials continue to be short.

● **Melbourne, Australia** — Construction manpower shortage is very critical. Long waiting lists are not unusual for carpenters, bricklayers and other skilled building craftsmen. In the ensuing competition for men, wage rates in excess of those prescribed officially are frequently paid. Wages reported here are the official rates.

Construction wages outside the United States

Rates per hour in national currency in Dec., 1950, and Sept., 1951

North America

CITY and COUNTRY	Exch rate Sept 51 /$1 US.	Common labor Bldgs 9/51	Bldgs 12/50	Hvy constr 9/51	Hvy constr 12/50	Carpenters 9/51	Carpenters 12/50	Bricklayers 9/51	Bricklayers 12/50	Struct iron workers 9/51	Struct iron workers 12/50
Anchorage, Alaska[a]	$1	2.735	2.415	2.735	2.415	3.14	2.82	3.87	3.57	3.415	3.065
Montreal, Canada[a-c]	$1.08	1.09	1.00	1.03	0.85	1.55	1.40	1.75	1.60	1.65	1.50
San Francisco, USA[a]	$1	1.70	1.55	1.70	1.55	2.45	2.375	3.25[d]	3.00[e]	2.70	2.60
New York City, USA[a]	$1	1.90	1.90	1.90	1.90	3.094[e]	3.094[e]	3.548[f]	3.548[f]	3.348[g]	3.348[g]
Mexico City, Mex[a-h]	8.65p.	0.75	0.62	0.75	0.75	1.88	1.88	1.88	1.88	1.35	1.03
Havana, Cuba[a]	$1	0.80	0.81	0.62	...	0.82	0.82	0.82	0.82	0.82	0.82
San Juan, PR[a]	$1	0.35[i]	0.35[i]	0.65	0.65	0.80[i]	0.80[i]	0.85	0.80	0.70	0.80

[a] 8-hr day [b] Pd 7 days, work 6, rate per hr not adjusted for extra pay [c] cost of living bonus incl [d] 7-hr day [e] 6-hr day [f] incl 3% welfare fund and 20¢ pension fund [g] incl 3% welfare fund [h] rate for good carpenters; min wage: $0.65/hr [i] min wage; common labor-bldgs actually pd. more by industry

South America

CITY and COUNTRY	Exch rate Sept 51 /$1 US	Common labor Bldgs 9/51	Bldgs 12/50	Hvy constr 9/51	Hvy constr 12/50	Carpenters 9/51	Carpenters 12/50	Bricklayers 9/51	Bricklayers 12/50	Struct iron workers 9/51	Struct iron workers 12/50
Bogota, Colombia[a]	2.50p.	0.52	0.48	0.52	0.58	1.00	0.96	0.78	0.76	1.00[d]	....
Rio de Jan, Braz[a]	20cr.	5[c]	4.5[c]	7.5[c]	4.5[c]	10	9	10	9	11	10
Santiago, Chile[a]	94p.	11-12	9-11	12-14	11-13	20-22	18-20	15-18	14-16	15-17	14-16
Buenos Aires, Arg[a-b]	14.20p.	25.50[f]	25.50[e]	25.50[f]	25.50[e]	32-35[f]	32[e]	32[f]	32[e]	....	....
Caracas, Venez[a-b]	3.35Bs.	10-12	10-11	10-14	10-13	26[g]	25[c]	25[c]	24[g]	24	24

[a] 8-hr day [b] Advanced labor (adjudante) [c] Common labor (servante) [d] 44-hr wk [e] Add 75% to cover insurance and other social charges [f] Add 8% to cover insurance, 70% for social charges [g] pd 7 days, work 6 get 15 day pd vacation annually [h] per day Ranges: [A] 0.80-1.00p. [B] 21.50-26Bs [C] 21.50-25Bs [D] 21.50-24Bs

Europe

CITY and COUNTRY	Exch rate Sept 51 /$1 US	Common labor Bldgs 9/51	Bldgs 12/50	Hvy constr 9/51	Hvy constr 12/50	Carpenters 9/51	Carpenters 12/50	Bricklayers 9/51	Bricklayers 12/50	Struct iron workers 9/51	Struct iron workers 12/50
London, England[a-b]	7s	-/2/8	-/2/6½	-/2/8	-/2/6½	-/3/1½	-/3/-	-/3/1½	-/3/-	-/3/1	-/2/11½
Stockholm, Sweden[a]	5.15kr	...	3.50	4-5.50	3.75	5.5-6.5	5.00	6-7	5.50	5-6	....
Madrid, Spain[b]	11.22p	2.75	2.75	2.75	2.75	3.85	3.85	3.85	3.85	3.85	3.85
Paris, France[a]	350fr	92[c]	119	96[c]	141.5	116[c]	271	116[c]	219	116[c]	184
Amsterdam, Nthlnds[a]	3.80gld	1.068[d]	0.929	1.140[c]	0.990	1.261[d]	1.179	1.242[d]	1.160	1.150	1.103
Frankfort, Grmny[a-b]	4.20Dm	1.52	1.34	1.68	1.49	1.79	1.58	1.79	1.58	1.79	1.58
Rome, Italy[a]	625 lire	245.37[e]	237.20	245.37[e]	237.20	281.87[e]	276.75	256.90[e]	276.75	256.90[e]	276.75

[a] 8-hr da [b] employer pays addl 95% of worker's pay to social insurance fund [c] minimum, add 50% for social charges [d] on no-tariff bldgs [e] on tariff bldgs [f] aver tariff & no-tariff bldg [g] 8½-hr da [h] 48-hr wk [i] incl social chgs pd by contr, approx 30% of wage [j] 8½-hr da, 5½-hr Sat [k] 44-hr wk

Africa, Asia, and Australia

CITY and COUNTRY	Exch rate Sept 51 /$1 US	Common labor Bldgs 9/51	Bldgs 12/50	Hvy constr 9/51	Hvy constr 12/50	Carpenters 9/51	Carpenters 12/50	Bricklayers 9/51	Bricklayers 12/50	Struct iron workers 9/51	Struct iron workers 12/50
Cairo, Egypt[a-b]	7s	-/6/-	-/5/-	-/13/-	-/12/-	-/20/-	-/18/-	-/21/-	-/19/-	-/23/-	-/20/-
Bombay, India[a]	Rs.4/12/6	-/6/6	-/6/6	-/8/-	-/8/-	-/12/-	-/15/-	-/12/-	-/12/-	1/4/-	1/2/6
Tokyo, Japan[a]	380 Y	41.25	37.50	45.00	37.50	62.50	56.25	62.50	62.50	57.50	53.75
Manila, PI[a]	2.02 p	0.50	0.44	0.50	0.44	1.00[c]	0.82	1.00[c]	....	1.25	1.00
Melbourne, Australia[a-c]	9s	11/12/6[d]	10/13/4	11/12/6[d]	10/13/4	13/12/6	12/12/6	13/11/8	12/12/6	13/11/8[e]	11/2/6[d]
Johannesburg, Transvaal[a]	SAf £-/7/2	-/1/3½[f]	-/1/2½[f]	-/1/3½[f]	-/1/2½[f]	-/6/7[g]	-/6/1[g]	-/6/7[g]	-/6/1[g]	-/6/7	-/6/1
Haifa, Israel[a-b]	I£0.358	2.5	2.5	[h]	[h]	3.5	3.5	3.5	3.5	[h]	[h]

[a] 8-hr da [b] per da [c] per wk [d] 12/2/6 with some skill [e] 8.2 hr per da—5 days [f] 8.6 hr per da—5 days [g] 9.2 hr per da—5 days [h] no such category [i] income a composite of labor union wage rates and bonuses. Free labor market rates: common, I£ 2.8, carpenters, I£ 8, bricklayers, I£ 6

Ranges: [A] 0.75-1.00 [B] 8/11/- to 11/2/6 per wk [C] 10/5/6 to 13/11/8 per wk.

Construction materials

● **Mexico City, Mex.**—Steel and cement prices have climbed due to inflation here and in the U. S. Lumber shortage and increase in prices is due to rigid enforcement of timber conservation law, with no hope of change. Mexican sacred fir is being used almost exclusively for paper mills, with third class pine substituted for construction.

● **San Juan, P. R.**—Materials prices are under some control by Office of Price Stabilization as on the mainland. Allocation of imports from U. S. is limited to 85% of entire list of construction materials purchased in the U. S. market during the first 9 months of 1950.

But many dealers and importers purchased steel and copper products in Europe during 1950, thus their quotas are seriously reduced and many are compelled to continue to buy in Europe even though prices are up 50%. Steel is short, notably reinforcing bars, and orders are being placed in Belgium, Luxemburg and Germany. One importer is entitled to full U. S. import quota.

● **Rio de Janeiro, Brazil**—Skyrocketing steel prices are due to extreme shortage. Chicago Bridge & Iron quotes a 2-year wait for delivery. Official cement prices reflect inflation, but in addition a shocking black market exists.

● **Santiago, Chile**—Serious inflation exists in Chile. Few items are short since Chile now imports on a free exchange basis.

● **London, England**—The rearmament program has increased demands on the building industry for factories, also houses and schools. Copper tube is very tight, also plumbers' brassware and iron and steel present some difficulty.

● **Stockholm, Sweden**—A 33% rise in portland cement price is due to mounting fuel costs. Lower quality lumber prices are up sharply. This is due to competition from exporters who formerly took only the better grades, but now take anything.

● **Madrid, Spain**—Prices shown are official quotations at the mill. But freight transportation is so expensive that these figures are not exactly representative of cost of material at the job.

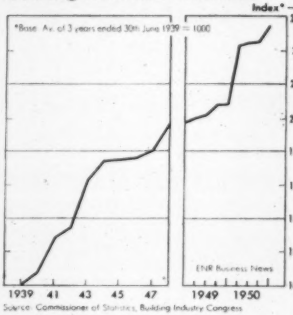
● **Frankfort, Germany**—Informed circles feel that the price of lumber may jump by as much as 40-50% if government price control is lifted this fall. And this appears to be more than a mere possibility. Until controls are lifted, lumber is in tight supply, with sellers holding on to stocks to await higher prices.

● **Rome, Italy**—No shortage of any material exists at present. Cement was short a few months ago, owing to irregularity in arrival of coal. Materials prices are up an average of 10% since the Korean crisis. The most striking increase is for wood, up 30-45% due to the trend of the international markets, since most of this material is imported.

● **Cairo, Egypt**—Despite increasingly high prices of construction materials, especially steel, construction activity is going on as usual. Most active are residential buildings, apartment houses and office buildings.

Local cement plants are having a hard time satisfying all demands. The price quoted is fixed by the government, but there is considerable black market activity in this material. Steel prices have soared, but are low by comparison to prices in Europe.

Wholesale price index of building materials—Australia



Source: Commissioner of Statistics, Building Industry Congress

● **Bombay, India**—Construction materials continue short. In cement this is due to a continual transport bottleneck, since India is actually producing its present cement requirements. The transport bottleneck is due in part to the necessity of rushing food to famine threatened areas.

● **Melbourne, Australia**—All materials, steel, cement, lumber are in short supply, but sand and gravel are plentiful. Local cement is exceedingly difficult to obtain and considerable quantities are being sold on grey or black markets.

Materials prices outside the United States

Rates in national currency, in Dec., 1950, and Sept., 1951—carload lots, fob city

North America

CITY and COUNTRY	Exch 9/51 $1 US	Struct steel /cwt 9/51	Struct steel /cwt 12/50	Reinf steel /cwt 9/51	Reinf steel /cwt 12/50	Portland cement /bbl 9/51	Portland cement /bbl 12/50	Lumber 2x4, s4s/Mfbm 1st cl pine 9/51	Lumber 2x4, s4s/Mfbm 1st cl pine 12/50	Lumber 2x4, s4s/Mfbm 2nd cl pine 9/51	Lumber 2x4, s4s/Mfbm 2nd cl pine 12/50	Log equiv 9/51	Log equiv 12/50
Anchorage, Alaska	$1 00	4 30[a]	4 05[a]	5 55[a]	5 35[a]	3 80[a,f]	3 25[a]	115[a,r]	100[a,r]	115[a,r]	100[a,r]	115[r,t]	100[r,t]
Montreal, Can	$1 06	6 75[a,m]	6 75[a,m]	4 75[a,m]	4 75[a,m]	2 66[a]	2 66[a]	95[r,t]	75[r,t]	175[a,r]	160[a,r]	....	....
San Francisco, USA	$1 00	7 15[a,h]	6 30[a,h]	6 50[a]	5 75[a]	3 35	3 39	70[a]	89–95[a,r]	.....	.....	....	....
New York, USA	$1 00	6 30[a]	5 75[a]	6 25[a]	5 69[a]	3 81	3 61	77[a]	80[a]	105[a]	105[a]	....	....
Mexico City, Mex	8 85[p]	1,111 01[a]	1,033 30[a]	1,230 37[a,f]	1,108 30[a,f]	130[a]	125[a]	1,400	1,050	1,100	950	850[w]	800[w]
Havana, Cuba *	$1 00	220–280[a,B]	400[a]	185[a]	155[a]	4 46[a]	4 31	180	.....	175	175	.....	.....
San Juan, PR	$1 00	240[a]	240[a]	7.50	7.50	4 20	4 40	140	145	110	115	....	....

[a] fob whse [b] fob dock, Seattle-freight rate: $55/t to Anchorage, $80/t to Fairbanks for steel; $30/t to Anchorage, $40/t to Fairbanks for cement; wharfage, handling, 3% transp tax, all incl [c] per ton, 2000 lb [d] per metric ton, 2204.6 lb [e] subj to 10¢ disc; dealer's comm not incl [f] $7.35/bbl fob Anchorage [g] 3 in.–15 in. x 12 meters [h] rolled [i] Geneva mill [j] 5t or more [k] 3 4-in x 11 meters [m] plus Dominion, provincial, and municipal sales taxes [o] Tolteca [p] incl delivery $0.23/bbl [q] direct mill shipment [r] fob mill [s] Douglas Fir [t] Spruce [u] fob mill, rail freight NW to city: $11.50–$15/Mfbm [v] delivered [w] Mexican sacred fir, Oyamel

Ranges: *A 937–1,033.30 *B Fabricated and erected: $350–$360/t.

South America

		/ton		/ton		/ton							
Bogota, Colombia	2 50 p	900[a,f]	800[a]	600[a,f]	700[a]	72 80[a]	72 80[a]	5 50[a]	5 00[a]	4 30[a]	4 30[a]	....	....
Rio de Janeiro, Braz	20 cr	6,640[a]	4,400[a]	6,600[a]	4,500[a]	800[a]	640[a]	5 00[a]	2 80[a]	....	....	3 40[a,m]	2 00[a,m]
Santiago, Chile	94 p	18,500[a]	14,500[a]	12,900[a]	9,500[a]	1,750[a]	1,500[a]	15,000[a,c]	14,000[a,c]	7,400[a]	5,800[a]	7,400[a,c]	5,800[a,c]
Buenos Aires, Arg	14 20 p	2,500[a]	1,500[a]	1,800[a]	1,450[a]	220[a]	180[a]	22[a,n]	33[a,n]	18[a,n]	23[a,n]	22[a,n]	27[a,n]
Caracas, Venez	3 35 Bs	[d]	[d]	650[a,d]	500[a,d]	95[a]	95[a]	.....	.....	.....	.....	280[a,n]	310[a,n]

[a] per ton, 2000 lb [b] per long ton, 2240 lb [c] per metric ton, 2204.6 lb [d] practically all hvy bldg of reinf conc [e] 20x20 cm beam/meter in length [f] per sq ft [g] Alamo poplar [h] per sq meter, 1-in thick [i] iron rods [j] per cu meter [k] Saqui-saqui [l] per Mfbm of 1x10-in [m] 3rd ci pine [n] 3x4-in spruce [o] 1x6-in spruce [p] 1x12-in spruce [q] black market price: 1,100

Ranges: *A 850–900p *B 550–600p *C 10,000–14,000p

Europe

London, England	7 s	37/–/–[b]	21/16/0[a,b]	37/–/–[b]	22/11/–[a,c]	4/6/3[b]	3/18/–[a,b]	125/–/–[f,g]	90/–/–[f]	100/–/–[f,g]	80/–/–[f]	80/–/–[f]	80/–/–[f]
Stockholm, Sweden	5 18 kr	800 00[a]	600 00[a]	806 00[a]	615 50[a]	92 00[a]	69 00[a]	10 00[a]	7 00[a]	7 90[a]	5 00[a]	....	....
Madrid, Spain	11 22 p	7,200[a]	3,975[a]	3,400[a]	2,850[a]	329 00[a]	375 80[a]	2,500[a,g]	950[a]	1,500[a,g]	900[a]	....	....
Paris, France	350 fr	35,500[a]	33,400[a]	34,500[a]	22,400[a,d]	3,305[a]	2,836[a]	10,000[a,h]	8,500[a]	8,500[a,h]	7,000[a]	....	....
Amsterdam, Nethlds	380 gld	549 00[a]	367 50[a]	537 50[a]	360 00[a]	53 50[a]	44 50[a]	....	....	....	....	237 30[a,i]	223 81[a,i]
Frankfort, Germany	4 20 Dm	550[a]	400[a]	550[a]	400[a]	75[a]	66[a]	220[a]	180[a]	190[a]	160[a]	170[a,m]	140[a,m]
Rome, Italy	625 lire	106[a,i]	90–91[a,i]	9,800[a,i]	8,880[a,i]	1,025[a,k]	960[a,k]	.....	.....	33,000[a,k]	25,000[a,k]	27,000[a,k]	15,000[a,k]

[a] per ton, 2000 lb [b] per long ton, 2240 lb [c] per metric ton, 2204.6 lb [d] per kilo [e] per 100 kilos [f] per 165 cu ft [g] av of 5–8mm, 12–17mm, & 25–35mm diams [h] plus transport to city by rail, barge or truck [i] per cu meter [j] fob mill [k] delivered [l] 1½" x 4" pine [m] 3rd ci pine [n] per cu ft

Ranges: *A 18,990–22,400 *B 20/13/6 to 21/18/– *C 21/13/6 to 22/11/– *D 3/5/– to 3/18/– *E £120–125 *F £95–100 *G 1,500–2,500 *H 900–1,500

Africa, Asia, and Australia

Cairo, Egypt	7 s	53/–/–[a]	43/–/–[a]	£50–52[a]	£39–42[a]	5/10/–[a,f]	5/10/–[a,f]	30/–/–	24/2/–	23/–/–	22/2/–	18/–/–	17/10/–
Bombay, India	Rs 4 12/6	500/–/–[b]	700/–/–[b]	400/–/–[b]	420/–/–[b]	112/–/–[b]	112/8/–[b]	12/–/–[l,m]	8/8/–[l,m]	10/–/–[l,n]	7/–/–[l,n]	....	....
Tokyo, Japan	360 Y	62,000[a]	29,000[a]	50,000[a]	33,000[a]	8,600[a]	5,300[a]	2,600[a]	2,200[a]	2,000[a]	1,700[a]	....	....
Manila, Philippines	2 02 p	1,500[a]	350[a]	300[a]	290[a]	3 60[a]	3 00[a]	350	250	.....	230	230–240[a]	230[a]
Melbourne, Australia	9 s	35/–/–[a]	20/–/–[a,p]	45/–/–[a]	25/–/–[a]	12/–/–[a,f]	8/–/–[a,f]	7/7/6	6/10/–	.....	.....	4/4/9	3/10/–
Johannesburg, So. Africa	£–/7/2	65/–/–[a,f]	47/–/–[a]	60/–/–[a,f]	47/–/–[a]	–/4/5[a]	–/4/–[a]	–/3/4[a]	–/2/4 75[a]	–/3/4[a]	–/2/4 75[a]	–/2/3[a,r]	–/2/1[a,r]
Haifa, Israel *	I£ 0 358	125[a]	65[a]	80[a]	60[a]	9 27[a]	8 27[a]	55[a]	40[a]	50[a]	35[a]	....	23[a]

[a] per ton, 2000 lb [b] per long ton, 2240 lb [c] per metric ton, 2204.6 lb [d] Tasmanian: 9/51, £12/12/6; 12/50, £8/10/–; imported: 9/51, £19 to £28; 12/50, £13, long ton [e] per 94 lb bag [f] imported, fob coastal port; local: £25 per ton for both struct shapes & reinf steel [g] High black market price due to restricted supply from US [h] Fir [i] per koko, 1x1x10 ft [k] Red Lauan [l] per cu ft [m] Indian teakwood, 1st cl [n] Indian teakwood, 2nd cl [o] imported: £75 to £80 per long ton [p] imported: £37 per long ton [q] imported: £70 per long ton [r] 9x3-in, per running ft [s] 3/4-1-in dia; for 3/16-in dia: £47 Dec. '50; £65 Sept. '51 [t] European spruce [u] per cu meter [v] controlled prices. Prices for imports paid for from funds sources abroad (and not subject to price controls) are: struct steel and reinf steel to I£220/metric ton; cement to I£22/metric ton [w] local

Ranges: *A 4/14/– to 5/10/–

Whatever the field of construction — Industrial, Building, Marine, or Heavy — Merritt-Chapman & Scott brings to each job a background of experience that takes the toughest construction problems in stride. Bridge or tunnel ... chemical plant or paper mill ... M-C&S has the all around know-how that time and again brings projects to completion ahead of schedule and at less than estimated cost.

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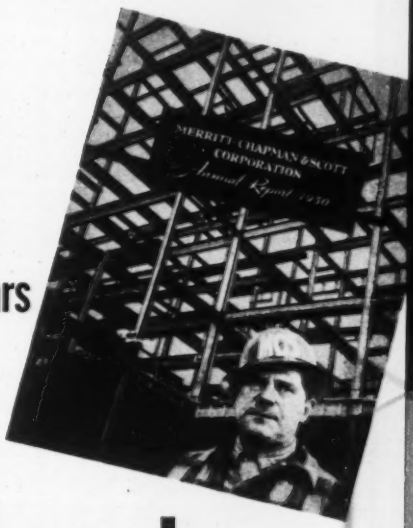

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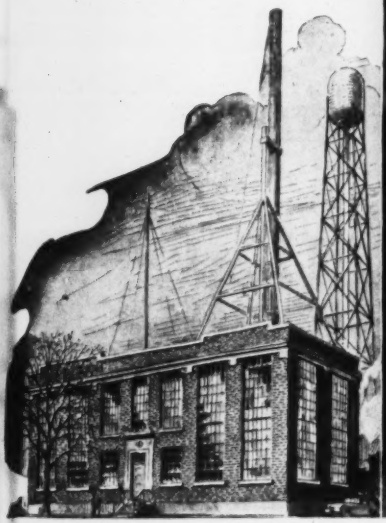

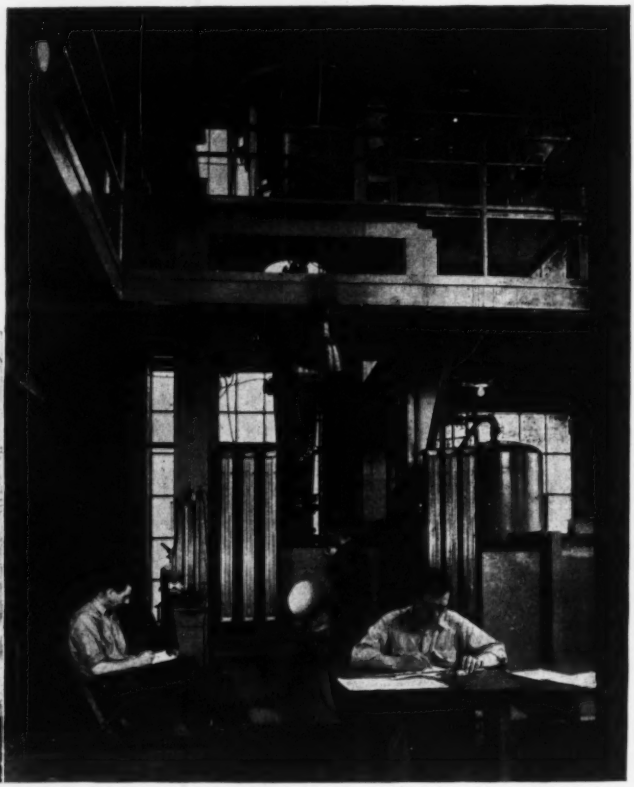

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PROVING everything in advance! This in large measure accounts for our supremacy in the field of Hydraulics. We very early recognized that the designing of modern, high efficiency turbines, pumps and adjustable blade ship's propellers requires precise scientific knowledge. Hence we established our own Hydraulic Testing Laboratory where the answers to problems are worked out in homologous models before production starts -- another advantage of placing your hydraulic problems in our hands!

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YORK, PENNA. U.S.A.

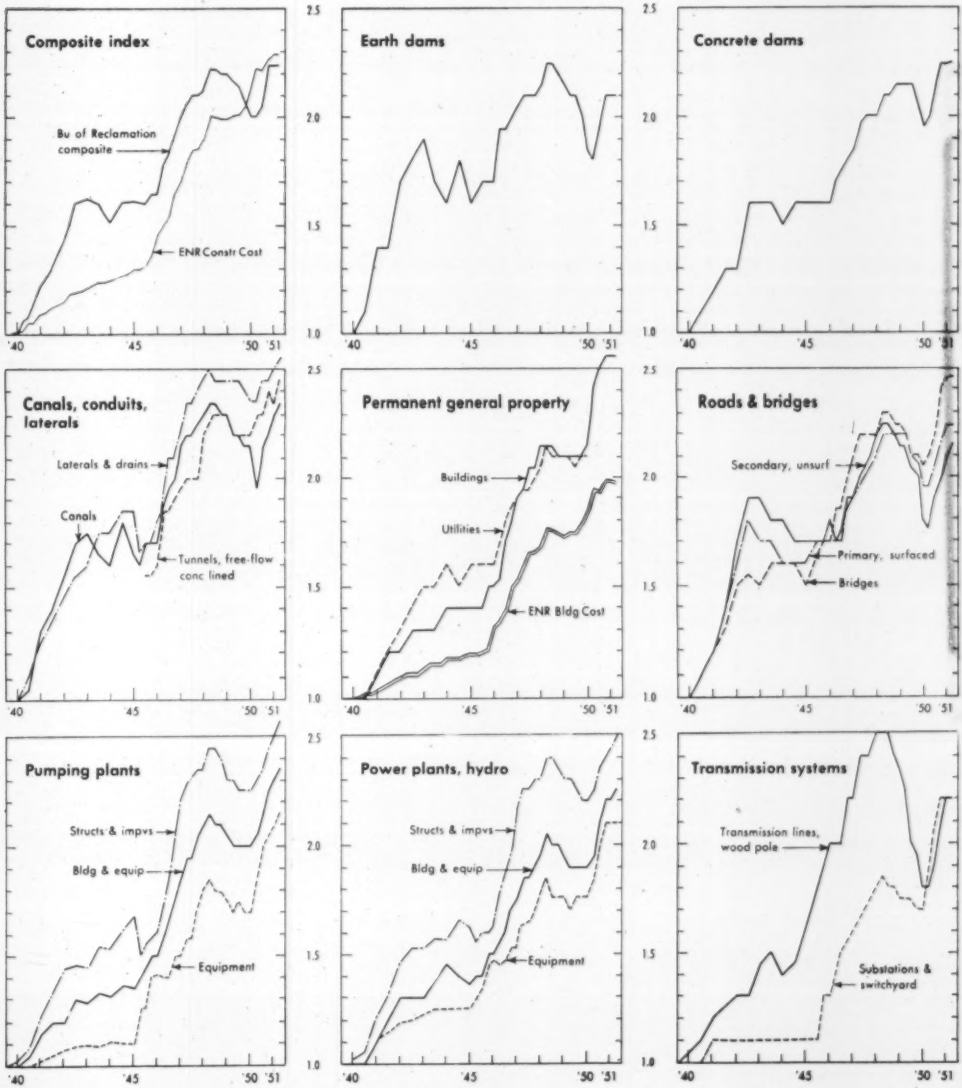
Irrigation and hydro-power construction cost indexes—Jan. 1940 = 1.0

Bureau of Reclamation, Design and Construction Division, Denver, Colo.

	July '50	Oct '50	Apr '51	*July '51
Composite index	2.00	2.00	2.25	2.25
Dams, earth	1.85	1.75	2.10	2.10
Dams, concrete	1.95	2.00	2.25	2.25
Pumping plants, building & equipment	2.00	2.05	2.25	2.30•
structures, reinforced concrete, & imprv	2.25	2.30	2.45	2.50•
equipment	1.70	1.85	2.05	2.10•
pumps & prime movers	1.70	1.80	2.05	2.10
accessory electric & misc equipment	1.75	1.90	2.05	2.20
discharge pipes	2.10	2.25	2.45	2.50
Canals	2.15	1.95	2.20	2.30•
Conduits, tunnels, free flow, concrete lined	2.20	2.30	2.40	2.35b
Laterals and Drains	2.35	2.35	2.45	2.50•
Primary roads	1.95	1.95	2.15	2.25
Secondary roads, unsurfaced	1.80	1.75	2.00	2.10•
Bridges	2.05	2.10	2.40	2.45
Powerplants, hydro, building & equipment	1.90	1.95	2.20	2.30•
structures, reinforced concrete, imprv	2.20	2.25	2.40	2.45•
equipment	1.75	1.85	2.10	2.10
turbines & generators	1.70	1.80	2.10	2.10
accessory electrical equipment	1.75	1.85	2.10	2.10
miscellaneous equipment	1.90	1.95	2.15	2.20
penstocks	2.10	2.25	2.45	2.80
Transmission switchyards & substations	1.70	1.85	2.20	2.20
Transmission lines, wood pole	1.80	1.80	2.10	2.20
Transmission lines, steel tower	1.75	1.80	2.15	2.15
Permanent general property, buildings	2.15	2.40	2.60	2.60

* Oct '51 same values except as noted • a Oct '51, 5 c. higher • b Oct '51 10 c. higher

Based on the combined costs of material and labor furnished by the contractor and material and labor furnished by the government on Bu of Reclamation projects in 17 western states.



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Cost records on SEAMAN-mixed road jobs show indisputable evidence that the SEAMAN-way is by far the most economical. That is a fact; figures prove it.

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SEAMAN MOTORS, INC.

281 N. 25TH STREET MILWAUKEE, WISCONSIN

Building trades wage rates—September 1, 1951

Quoted in $/hr., 8-hr. day; time and one-half for overtime after 40 hr. except where noted.

Compiled by E N R City and State		Carpenters	Bricklayers	Structural Ironworkers	Reinf. Ironworkers	Labor Bldg.	Labor Hvy. Constr.	Stonemasons	Mason's Helpers	Plasterers	Mosaic & Terrazzo	Tile Layers	Cement Finishers	Lathers	Electricians (Inside)	Painters	Glaziers	Plumbers	Steamfitters	Roofers	Water-proofers	Sheet Metal Workers	Welders	Hoist Engr., 1-Drum	Hoist Engr., 2-Drum	Tractor Oper. (30-hp +)	Shovel Oper.	Truck Dr. (1½ T +)
Atlanta, Ga.	e	$2.04	$2.75	$2.34	$2.25	$1.05	$1.05	$2.75	$1.05	$2.50	$2.75	$2.75	$2.31	$2.50	$2.50	$2.04	$2.04	$2.08	$2.75	$1.50	$1.50	$2.09	$2.34	$1.75	$2.25	$1.75	$2.25	$1.50
Austin, Tex.		2.13	3.30	2.38	2.13	[41] 1.00	[41] 1.00	3.00	[91] .38	3.00	2.50	2.50	2.25	3.00	2.50	[31] .88		2.48	2.48	[84] 2.00		2.50	2.00	2.00	2.25	[92] 2.00	2.25	1.00
Baltimore, Md.	p	[92] 2.59	[43] 3.20	[92] 2.80	[92] 2.60	[93] 1.49	[93] 1.49	[43] 3.25	[93] 1.59	[92] 2.75	[92] 2.50	[92] 2.50	[92] 2.45	2.75	2.75	[43] 2.05	2.15	2.50	2.50	[43] 2.00	2.25	[92] 2.65	*	[82] 2.80	[82] 2.80	[82] 1.95	[82] 2.80	1.40
Billings, Mont.	f	2.20	3.00	[24] 2.48	2.48	1.61	1.65	3.00	1.98	2.75	3.00	3.00	2.25	2.25	2.34	2.00	2.00	2.50	2.50	2.07	2.07	2.38	*	1.98	2.20	2.20	2.36	[71] 1.81
Birmingham, Ala.		2.13	2.75	2.42	2.17	1.10	1.20	2.75	1.10	2.42	2.50	2.50	2.28	2.35	2.50	2.25	2.00	2.50	2.50	1.94	1.76	2.20	2.35	[42] 2.35	2.35	2.34	2.34	1.30
Bismarck, N. D.		1.92	2.61	2.47	2.47	1.25	1.25	2.61	1.43	2.50		2.61	2.25	1.75	2.25	1.92	1.92	2.30	2.30	1.75	1.75	1.90	*	2.00	2.15	2.00	2.25	1.35
Boston, Mass.	q	2.48	2.90	2.75	2.75	1.82	1.82	2.89		2.97	2.61	2.61	2.89	2.97	[42] 2.80	2.25	2.23	2.70	2.70	[42] 2.43	[42] 2.43	[42] 2.59		[112] .00	[112] .00	[97] .00	[112] .00	1.55
Buffalo, N. Y.	kk	[82] 2.68	[83] 3.02	[82] 2.83	[82] 2.83	[82] 2.02	[82] 2.02	2.78	2.12	[82] 2.90	[82] 2.71	2.71	[82] 2.66	[82] 2.90	2.75	2.38	2.35	2.65	[82] 2.80	[82] 2.55	2.55	[82] 2.68		[82] 2.83	[82] 2.83	2.33	2.83	[83] 1.92
Burlington, Vt.		2.00	2.75			1.38	1.38	2.75	1.38				2.25		1.75	1.75	1.60	2.25	2.25	2.25		2.50	1.50				1.00	
Charleston, S. C.		1.92	2.50	2.00	2.00	.90	.95	2.50	1.00	2.00	2.00	2.00	2.00	2.00	2.00	1.75	1.75	2.50	2.50	2.00	1.75	2.00	2.00	1.00	1.50	1.50	2.00	1.50
Charleston, W. Va.	r	2.34	[42] 2.75	2.50	2.50	1.60	1.60	2.75	1.75	2.50	2.75	2.75	2.75	2.35	[42] 2.34	2.55	2.25	*	2.48	2.48	1.93	1.93	2.30	*	2.50	2.50	2.05	2.50	1.70
Charlotte, N. C.		1.85	[42] 2.50	2.25	1.88	.95	.95	2.25	1.50	2.25	2.50	2.50	1.80	2.25	2.00	1.65	1.65	2.38	2.38	1.38	1.50	2.00	1.88	1.62	1.88	1.88	1.88	1.00
Chicago, Ill.	s	2.70	[d] 2.825	[45] 2.80	[45] 2.80	[45] 2.05	[45] 2.05	2.75	2.00	[87] 2.87	2.70	2.70	[45] 2.70	2.80	[45] 2.91	2.60	2.80	[45] 2.75	[45] 2.75	[45] 2.80	2.75	[45] 2.75	2.80	2.65		2.37	3.00	1.75
Cincinnati, Ohio	t	2.48	2.94	2.67	2.35	1.65	1.65	2.84		2.67	2.64	2.64	[37] 2.37	[42] 2.65	2.70	[37] 2.31	2.50	2.64	2.64	[42] 2.25		2.35		[42] 2.85	[42] 2.85			[e] 1.80
Cleveland, Ohio		2.83	3.00	2.83	2.83	2.10	2.10	3.00	[42] 2.10	2.83	2.28	2.65	2.65	2.83	2.83	2.53	2.65	2.83	2.83	[42] 2.70	2.70	2.65	2.83	2.58	2.83	2.25	2.93	1.75
Columbus, Ohio		2.39	2.75	2.60	2.60	1.56	1.56	2.75	1.76	2.63	2.15	2.37	2.63	2.63	[42] 2.63	2.20	2.05	2.61	2.61	2.25	2.43	2.45	2.45	2.34	2.34	2.34	2.60	1.63
Concord, N. H.		[42] 2.00	3.13	2.50	2.70	[41] .40	[41] .40	3.13	2.00	3.13	2.75	2.75	3.13	1.85	2.00	1.65		2.10	2.10	1.85		2.10	2.10	2.18	2.18	1.83	2.28	1.45
Dallas, Tex.	b	2.34	3.44	2.50	2.25	1.20	[91] .50	3.44	1.35	3.13	2.50	2.50	2.38	3.13	[42] 2.63	[42] 2.20	1.93	2.62	2.62	1.93	1.93	2.50	2.61	2.20	2.48	2.38	[13] 1.35	
Dayton, Ohio	u	2.50	2.89	2.67	2.67	1.67	1.52	2.89	1.88	2.53	2.61	2.50	2.32	2.67	2.89	2.37	2.28	2.62	2.62	2.50	2.18	2.50	2.53	2.50	2.38	2.38	2.63	1.73
Denver, Colo	h	2.33	3.00	[42] 2.35	[42] 2.35	[41] .58	[41] .58	3.00	1.93	3.00	2.60	2.60	2.48	3.00	2.65	[42] 2.34	2.20	2.65	2.65	2.35	2.35	2.33	2.50	2.35	2.48	2.31	2.48	1.68
Des Moines, Ia.	jj	2.25	2.88	2.47	2.25	N.A.	1.65	2.88	N.A.	2.62	2.13	2.25	2.33	2.42	2.55	[46] 1.90	1.98	2.61	2.50	1.79	N.A.	2.25	*	N.A.	N.A.	2.10	2.25	1.71
Detroit, Mich.		2.80	[24] 2.85	[42] 2.90	2.48	1.90	1.90	2.85	1.90	[43] 2.01	2.63	2.63	2.40	2.89	2.45	2.35	2.20	2.70	[42] 2.75	2.64	2.98	2.63		2.60	2.90	2.60	2.60	1.93
Duluth, Minn.	j	2.13	[42] 2.60	2.48	2.23	[13] 1.55		2.60		2.58		[13] 2.20	2.00	2.40	2.30	1.90	[14] 1.90	2.30	2.30	2.00	2.00	2.25	*		2.22	2.22	2.45	1.25
Forth Worth, Tex.		[42] 2.25	3.13	2.50	2.25	1.00	1.10	3.13	[91] .25	3.13	2.50	[42] 2.50	2.50	3.13	2.50	2.25	2.13	2.50	2.50	[18] 1.95	1.95	2.50	2.38	2.13	2.38	2.00	2.25	1.25
Harrisburg, Pa.	v	[42] 2.15	2.75	2.90	2.65	1.35	1.35	2.75	1.50	2.47		2.75	2.42	2.50	2.50	[41] .85	2.00	2.35	2.35	1.65	1.90	2.20	*	2.80	2.90	2.18	2.90	1.50
Helena, Mont.	g	2.38	3.00	2.25		1.50	1.50	2.50	1.50	3.00				[42] 2.40	3.00		2.50											
Houston, Tex.	l	2.40	[43] 3.03	2.53	2.40	1.48	1.48	3.03	1.68	3.00	2.65	2.65	2.40	3.00	2.75	2.13	2.28	2.61	2.61	2.28	2.15	[42] 2.65		2.15	2.53	2.15	2.53	1.23
Indianapolis, Ind.	a	2.53	2.75	2.70	2.70	1.65	[21] 1.25	2.75	1.85	2.75	[52] 2.50	2.50	2.28	2.61	2.63	2.33	2.25	[52] 2.67	2.67	2.00	2.00	2.50		2.60	2.60	2.60	2.60	[36] 1.70
Jackson, Miss.		2.05	2.75	2.40	2.15	1.00	1.00	2.75	1.10	2.40	2.30	2.30	2.40	2.25	2.25	2.00	1.38	2.25	2.25	[13] 1.65	1.75	2.00		[13] 2.00		2.00	2.25	[13] 1.25
Jacksonville, Fla.		[42] 2.00	2.65	[42] 2.15	[41] .80	[42] .90	1.00		.85	2.38	2.25	2.25	1.84	2.25	2.25	[42] 1.87	1.75	2.75	2.75	[42] 1.89	[42] 2.00	2.50	2.00	2.00	2.00	1.65	2.00	1.25
Kansas City, Mo.	w	2.37	2.86	2.53	2.39	1.73	1.73	2.59	1.99	3.03	2.59	2.59	2.37	2.70	[42] 2.66	2.26	2.48	2.63	2.63	2.20	2.20	2.67	*	[29] 2.37	[32] 2.61	[32] 2.37	2.37	[7] 1.82
Los Angeles, Calif.	k	2.35	[43] 3.00	2.50	2.38	1.75	1.75	[43] 3.00	1.83	3.13	2.40	2.50	2.38	3.38	2.63	[12] 2.38	[12] 2.16	2.63	2.63	2.65	2.50	2.47	*	2.25	2.25	2.50	2.68	1.85
Louisville, Ky.	jj	[42] 2.25	2.92	2.45	[42] 2.25	[41] .60	[41] .60	2.78	[42] 2.25	2.63	2.25	2.25	[42] 2.25	2.35	2.50	2.05	2.15	[42] 2.63	[42] 2.63	1.80		2.35	2.10	2.30	2.30	2.30	2.30	[41] 1.62
Meridian, Miss.		2.00	2.75	2.50	2.50	.90	.90	2.75	1.25	2.25	2.75	2.75	2.00	1.75	3.25	2.00	2.25	3.25	2.25	[17] 1.65	2.25	2.00	[5] 2.00	[2] 2.00		2.00	2.25	[13] 1.25
Milwaukee, Wis.		[42] 2.69	[42] 2.97	2.64	2.53	1.96	2.08	[42] 2.97	2.08	[42] 2.75	2.60	[42] 2.40	2.41	[42] 2.75	[42] 2.53	2.45	2.47	2.59	2.59	2.35	2.35	2.53	2.64	2.53	2.53	[34] 2.47	2.86	1.91
Minneapolis	bd	[42] 2.40	[42] 2.90	[42] 2.57	[42] 2.44	1.67	1.67	2.90	2.07	2.75	2.54	2.50	2.45	2.66	[42] 2.65	[42] 2.26	1.92	2.55	2.55	[42] 2.25	2.20	[42] 2.50	*	[42] 2.35	[42] 2.35	[42] 2.07	2.27	[71] 1.87
Nashville, Tenn.	x	2.00	2.75	2.25	2.10	.93	1.00	2.75	1.08	2.63	2.50	2.50	1.90	2.38	[40] 1.80	1.75	1.38	2.38	2.00	2.00	2.00	2.25	*	1.75	2.00	[8] 1.63	2.15	1.30
New Orleans, La.	y	2.06	2.70	2.45	2.45	1.10	1.10		1.20	2.38				2.38	2.50	2.05	1.88	2.45	2.45	1.83		2.12	2.33	2.33	2.33	2.06	2.33	1.15
New York City	ii	3.00	3.25	[3] 3.25	3.00	[4] 1.90	[4] 1.90	3.20	[21] 1.25	3.30	3.00	[3] 3.00	3.00	3.00	3.20	3.00	3.00	3.00	3.00	3.10	3.00	3.00	3.10	2.75	2.75	3.00		3.50
Newark, N. J.	a	3.25	3.50	[3] 3.25	[3] 3.25	[12] 2.34			2.19	3.25			3.25	[3] 3.25	[3] 3.25	2.75	2.85	[3] 3.10	[3] 3.00	[13] 3.14		3.00		[3] 3.35	[3] 3.35	[3] 2.60	[3] 3.35	2.85
Oklahoma City	jj	2.20	3.50	2.25	2.25	1.30	1.30	2.50	1.45	3.00	2.50	[42] 2.75	2.38	3.00	2.50	2.00	1.90	2.50	2.50	[42] 2.03	1.90	2.50		1.75	2.00	1.75	2.00	1.35
Omaha, Neb.	z	2.28	2.75	2.38	2.38	1.48	1.48	2.75	1.48	2.65	2.48	2.48	2.28	2.50	2.59	2.00	1.93	2.58	[15] 2.58	1.90	1.90	2.30	1.58	2.20	2.20	2.20	2.46	1.47
Philadelphia	aa	2.65	[3] 3.31	[3] 3.05	[42] 2.64	1.51	1.81	2.88	1.51	[43] 3.08	2.86	[42] 2.75	2.65	[42] 2.93	3.28	2.20	2.38	[42] 2.85	[42] 2.85	[42] 2.50	[42] 2.50	[42] 2.91	*	2.65	2.65	2.28	2.90	
Phoenix, Ariz.	f	[42] 2.68	3.30	2.63	[42] 2.43	[41] .78	[41] .78	3.30	2.10	3.08	3.30	3.00	[42] 2.43	3.00	2.50	[42] 2.25	2.05	2.50	2.50	2.00	2.00	2.25	2.20	2.25		2.00	2.40	[41] 1.03
Portland, Ore.	bb	2.30	3.00	2.50	2.30	1.75	1.75	3.00	2.20	2.85	2.60	2.60	2.30	2.75	2.60	2.30	2.25	2.77	2.77	2.38	2.38	2.40	*	2.10	2.40	[35] 2.30	2.45	1.75
Providence, R. I.	cc	2.30	2.89	2.60	2.65	1.50	1.65	2.89	1.65	2.85	2.25	2.25	2.50	2.85	2.40	1.95	2.23	2.40	[25] 2.55	[42] 2.20	2.20	2.40	[34] 2.25	2.63	2.63	2.05	2.63	1.60
Richmond, Va.	ii	1.98	2.50	[42] 2.45	[42] 2.20	1.00	1.00	2.50	1.25	2.33			1.80	2.25	2.17	1.75	1.75	2.25			2.00	2.25	1.88	2.15	2.00	2.15	1.30
St. Louis, Mo.	a	[42] 2.70	[43] 3.09	2.75	2.75	1.77	1.77	[43] 3.09	2.20	[43] 3.00	2.75	2.75	[42] 2.85	[28] 2.88	[42] 2.75	[42] 2.75	2.75	[42] 2.63	[42] 2.63	[37] 2.48	*	[42] 2.75	*	2.21	2.76	2.76	2.76	1.66
St. Paul, Minn.	bd	[42] 2.40	[42] 2.90	[42] 2.57	[42] 2.44	1.67	1.67	2.90	2.02	2.75	2.54	2.50	2.45	2.75	[42] 2.65	[42] 2.25	1.92	2.35	2.55	[42] 2.25	2.20	2.48	*	2.35	2.35	[42] 2.07	2.27	[71] 1.87
Salt Lake City	m	2.05	2.75	2.33	2.25	1.50	1.50	2.75	1.90	2.63	2.25	2.25	2.05	2.50	2.40	[42] 2.00	1.85	2.50	2.50	2.15		2.25	*	2.00	2.10	2.15	2.30	1.40
San Antonio	n	2.20	3.00	2.50	2.25	1.06	1.06	3.00	1.33	3.00	2.25	2.25	2.50	2.88	[42] 2.50	2.00	2.00	2.63	2.50	[91] 1.50	*	2.50	*	[91] 1.88	2.13	2.13	2.13	1.50
San Diego, Calif.	o	2.35	[43] 3.00	2.46	2.38	1.75	1.75	[43] 3.00	1.83	3.13	2.50	2.55	2.38	3.38	2.63	[12] 2.38	[12] 2.04	2.63	2.63	2.65	2.50	2.47	*	2.25	2.25	2.50	2.68	[41] 1.80
San Francisco	dd	2.45	[13] 2.25	2.70	2.45	1.70	1.70	[43] 3.00	[11] 1.88	3.13	2.61	2.96	2.42	3.00	2.75	[12] 2.45	2.30	2.75	2.75	2.50	[12] 2.45	2.48	*	2.41	2.41	2.52	2.85	1.74
Santa Fe, N. Mex.		2.25	4.00	2.25	2.00	1.30		2.50		2.50		[42] 2.88	2.10	2.25	2.25	2.00	1.75	2.75	2.75	2.00		2.25	2.50	2.00	2.10	2.10	2.35	[41] 1.65
Seattle, Wash.	ee	2.42	[43] 3.30	2.57	2.37	1.97	2.00	[43] 3.30	2.22	3.00	2.58	2.75	2.37	3.00	2.65	2.37	2.28	2.75	2.75	2.37	2.37	2.52	2.53	2.50	2.50	2.50	2.80	[2] 2.58
Tacoma, Wash.	a	2.42	3.25	2.54	2.34	1.96	2.00	3.25	2.40	3.00	2.55	2.75	2.46	2.80	2.55	2.34	2.21	[42] 2.75	[42] 2.75	2.34	2.68	2.49	*	2.50	2.57	2.25	2.80	2.10
Toledo, Ohio	ff	[42] 2.67	[43] 3.00	[42] 2.89	2.70	[42] 2.01	[42] 2.01	3.00	[42] 2.14	[42] 2.89	2.89	2.89	[42] 2.89	[42] 2.89	[42] 2.89	[42] 2.37	2.13	[42] 2.89	2.89	[42] 2.48	2.48	[42] 2.61	2.89	2.76	2.76	2.62	2.76	[41] 1.73
Topeka, Kans.	c	2.00	3.00	2.53	2.39	1.20	1.20	3.00	1.50	[42] 2.50	2.50	2.75	2.25	2.25	2.50	2.25	2.25	2.40	[42] 2.50	[42] 2.50	1.85	1.85	2.13	2.50	1.88	2.13	2.13	2.13	[41] 1.35
Trenton, N. J.	hh	2.90	3.10	[43] 3.25	[43] 3.25	[41] .90	[41] .90	3.10		3.10	3.10	3.10	3.10	2.90	[43] 3.28	2.47	2.24	3.00	3.00	2.75	2.75	3.00						
Tulsa, Okla.		2.25	3.25	2.25	2.25	1.47	1.45	2.50	1.50	3.00	2.50	2.50	2.25	2.50	2.50	2.00	2.00	2.50	2.50	2.00	2.00	2.25		1.90	2.15	1.90	2.15	1.65
Youngstown	gg	2.50	2.88	2.73	2.73	1.78	1.78	2.88		2.75	2.37	2.38	2.50	2.75	2.68	[42] 2.38	2.45	2.68	2.68	2.50		2.50	*	2.65	2.68	*	2.68	2.13

NOTE: Rates rounded to nearest cent. * Same as craft doing work. † 7-hr. day. # 6-hr. day. ‡ Per week. § Negotiating new rate. [1] Brush. Spray $4, steel $2.29. [2] Brush. Spray $2. [3] $2.20 eff. 4/52. [4] Slate & tile $2.25. [5] Steel, gen. $2.06. [6] Handled by shops. [7] Steel $2.56. [8] Comp. Tile $2.35. [9] Comp. Slate & tile $2.83. [10] Brush. Spray $2.45. [11] Light $1.20. [12] Unskilled. Skilled $1.65. [13] Hard. [14] Outside. Inside $1.70. [15] Tile $2.05. [16] Semi-trailers $1.85. [17] Bit-up. Comp. $1.75, Slate & tile $2.00. [18] Min. [19] Over 5-T $1.38. [20] Light. [21] Heavy. [22] Inside. Outside $6. [23] Over 3-T $1.35. [24] 40-hp $2.69. [25] Brush. Spray $2.05. [26] Over 40-hp $1.75. [27] $120/wk. [28] $140/wk. [29] Comp! $2.90, struct $3.15. [30] Comp. Slate $2.10. [31] Over 50-hp. [32] Comp. Slate & tile $2.40. [33] 10¢ incr after 11/27. [34] $2.50 res. work. [35] Spray. Brush $2.50. [36] Comp. Slate & tile $2.50. [37] Brush. Spray $2.25, struct steel $2.13. [38] Comp. Slate tile & asb $1.75. [39] Brush. Spray $2.15, steel $2.03. [40] Under 6-T. [41] Brush. Spray $2.67. [42] Straight dump. Flat bottom $1.73, winch $1.79, mixer $1.84. [43] Over 5-T $1.45. [44] Brush. Spray $2.68, struct iron $2.63, swing work $2.38. [45] Brush. Scaffold & Steel $2.27. [46] Man. & Bx.; Bldyn & Queens $3.10 plus 3% WF & 2% PF. [47] Area rates. [48] Awaiting WSB appr.

RANGES: [a] 0 $5-0 90. [b] 1 00-1 25. [c] 1 05-1 25. [d] 1 28-1 50. [e] 1 50-2 07. [f] 1 52-1 87. [g] 1 57-2 07. [h] 1 60-1 80. [i] 1 66-1 81. [j] 1 71-1 82. [k] 1 83-1 95. [l] 1 85-2 85. [m] 2-2 25. [n] 2 10-2 55. [o] 2 34-2 50. [p] 2 50-2 93. [q] 2 60-2 80. [r] 2 75 3. [s] 2 78 3 53.

BENEFITS: [a] Incl 10¢ WF. [b] Incl 5¢ WF. [c] Plus 4% WF. [d] Incl 7½¢ WF. [e] Incl 1% WF. [f] Incl 6¢ WF. [g] Incl 4% vacation fund. [h] Plus 1% PF. [i] Plus 5% cost of living. [j] Incl 1-wk pd vacation. [k] Plus 12½¢ vacation fund. [l] Plus 3% WF-6 PH. [m] Plus 3% WF, 20¢ PF. [n] Plus 3% WF, 3% PF. [o] Plus 4% WF, 2% PF. [p] Plus 5% wkly bonus for hosp, etc. [q] Plus 4% W & PF, 6 PH. [r] Plus 3% WF. [s] Plus 10¢ WF, 11¢ PF. [t] Incl 2% WF. [u] Plus 9¢ WF. [v] Plus 12½¢ WF. [w] Plus 5% WF. [x] Incl 3% vacation stamps. [y] Plus 4% VF, 1% NPF. [z] Plus $1/straight time day WF.

OVERTIME: [a] DT Sat, Sun, & Hol. [b] DT Sat Sun & Hol carp, plumb. [c] DT brick, iron, oper engr. [d] DT brick, iron, lath, elect, plumb, steamf. [e] DT brick; iron, stone mas & help, pnt, mos & ter, tile, cement; (DT Sat, Sun & hol) plumb. [f] DT bricklayers. [g] DT carp, brick, iron, stone mas, plast, mos & ter, tile, lath, elect, plumb, steamf, sheet met, weld. [h] DT all but lab, mas help, mos & ter, tile, cement, elect, plumb, steamf, roof, waterp, tr driv. [i] DT brick, stone mas. [j] DT carp, brick, iron, stone mas & help, plast, lath, plumb, steamf; (DT Sun & Hol) lab, mos & ter tile. [k] DT iron. [l] DT brick, iron, plast, plumb. [m] DT carp, brick, iron, stone mas, plast, mos & ter, tile, lath, sheet met, oper engr; (DT Sat, Sun & Hol) plumb. [n] DT carp, brick, iron, stone mas & help, plast, lath, plumb, steamf; (DT Sun & Hol) lab, mos & ter, tile, cement, elect, plumb, steamf, roof, waterp, sheet met, oper engr, tr driv. [o] DT all but lab, mas help, elect, tr drv. [p] DT all but (DT Sat, Sun & Hol) mos & ter; (DT Sun & Hol) glas, tr driv; (TH M–F 7–8 a.m.; 4:30–6:30 p.m.) lab; (TH M–F 4:30–7 p.m.) cement; (TH M–F 5–12 mid) paint. [q] DT all but lab, cement, paint, roof, waterp, tr dr. [r] DT all but tr dr; (TH first 2½ hr) lab, cement; (TH 4:30–5:45 p.m.) mos & ter. [s] DT all but (TH first 2 hrs) cement. (TH M–F) painter, tr dr. [t] DT all but (DT Sat Sun & Hol) lab, mas help, cement, glas, roof, waterp, sheet met, oper engr, tr dr. [u] DT all but lab, paint, roof, waterp, oper engr, tr dr. [v] DT all but (DT 4:30 p.m. F–6:30 a.m. M & Hol) bldg lab; (DT mid–8 a.m. Sat, Sun, & Hol) hvy lab, paint; (DT Hol) plumb & steamf; (DT Sun & Hol) roof, waterp; (DT 6 p.m. Sat 7 a.m. M & Hol) tr dr. [w] DT all but lab, mas help; (DT Sat & Hol) carp, paint, glas, roof, waterp, sheet met, oper engr, tr dr. [x] DT all but (DT Sat & Hol) lab, mas help, roof, tr dr. [y] DT all but lab, mas help, mos & ter, tile, cement, elect, paint, glas, plumb, steamf, sheet met, weld, tr dr. [z] DT all but lab, mas help, mos & ter, tile, cement, elect, paint, glas, plumb, steamf, sheet met, weld, tr dr. [aa] DT all but (DT Sat, Sun & Hol) lab. [bb] DT all but cement, sheet met, oper engr, tr dr; (TH 6ct-Apr) roof & waterp. [cc] DT all but (DT Sun) hvy lab. [dd] DT all but (TH first 4 hr) carp; (TH first 2 hr) mos & ter, paint, glas, roof, waterp. [ee] DT all but (TH week-days) cement, elect, glaz, tr dr. [ff] DT all but (TH Sat) carp, bldg lab, paint. [gg] DT all but tr dr; (TH week-days) carp, lab, cement, elect, paint, plumb, steamf roof, sheet met. [hh] DT all but paint, glaz. [ii] DT all but bldg lab, mas help, elect; (DT Sun & Hol) hvy lab. [jj] No data given. [kk] DT carp, brick, iron. [ll] DT all but carp, mas & help, mos & ter, tile, paint.

AREA wage rates as established by the Wage Stabilization Board started to come through about October 10. Those through to date which effect wages shown here are marked by footnote 48

About Pumping Costs.....

MORETRENCH IS HIGH in UNIT COST because

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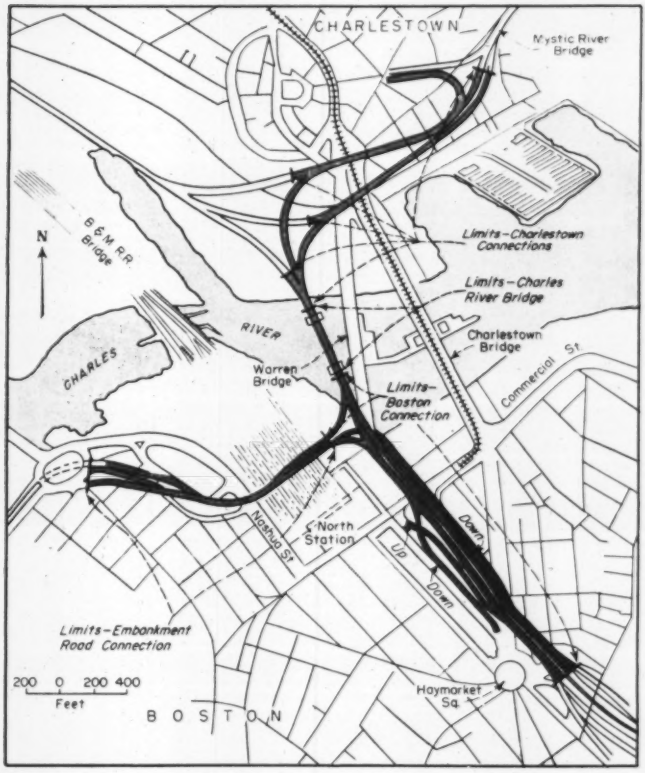
UNIT PRICES BID BY CONTRACTORS

Representing a cross section of construction ranging from the usual to the spectacular, from Boston to Los Angeles, from Florida to Oregon



Boston's John F. Fitzgerald Expressway

The first section of the first highway to be built in Boston Proper by the Commonwealth of Massachusetts, Department of Public Works, is a $30-million expressway in the heart of Old Boston. Connections are provided to the new Mystic River bridge, to a new Embankment road and to the old section of Boston in the vicinity of the Sumner Traffic Tunnel.

Known during its planning stage as Boston Central Artery, it has been officially renamed the John F. Fitzgerald Expressway. The engineers for the state are P. H. Kitfield, chief engineer, George H. Delano, project engineer, Department of Public Works. William F. Callahan is Commissioner. Consultants are Charles A. Maguire and Associates and Fay, Spofford and Thorndike, both of Boston.

Aerial photographs were used in the planning and a 1-in. to 50-ft scale model was built for bidders to study.

The expressway will have six lanes in divided roadways, and for the most part will be on a single-level steel structure with concrete deck and bituminous concrete surfacing. Part of the structure will be double deck. The connection to Embankment Road, across the B & M RR North Station, is a particularly difficult piece of design and construction. This section will be four 2-lane elevated roadways at varying levels.

The whole job will involve some 20 contracts. Nine major contracts now in force represent half the total cost. Of these, seven are represented here with full reports on unit prices bid by the successful contractor and by the runner-up.

The state will furnish steel sheet piling and steel H-piles for the substructure. Prices quoted for steel piles include only the driving, except for the Charles River Bridge.

Obviously much demolition would be involved and the cost of this on one section is in the substructure unit prices shown here for the Boston Connection. The days are gone when wrecking contractors paid for the privilege of salvaging building materials.

Minimum cement contents per cu yd of concrete for standard state mixes are: Cl A, 560 lb or 5.96 bags, Cl B, 500 lb. or 5.32 bags, Cl C, 440 lb or 4.68 bags, Cl D, 620 lb or 6.60 bags.

Contracts for deck construction include electrical work for roadway lighting and ramps, snow melting facilities.

Minimum wages range from $0.75 for water boy to $2.80 for hoisting engineers, crane operators, electricians. In between, the minimum for truck-drivers, 1½-ton or less is $1.38 per hr, over 1½-ton $1.55; common laborers and jack hammer operators, $1.675; painters $2.25; compressor operators, $2.35; carpenters, $2.375; iron workers, $2.70. Boston going rates are quoted: for carpenters, $2.475; iron workers, $2.75; hoisting engineers, $2.80; electrical workers, $2.75.

The number of bidders is shown separately for each contract, also the bid date and unit prices. Completion is set for June 30, 1953.

Substructure, Charles River Bridge

1C	T. Stuart & Son Co., Watertown, Mass.	$508,038
2	Coleman Bros. Corp., Boston, Mass.	545,563
3	Farina Bros., Newton, Mass.	888,743

Bids 9-26-50 Items	Unit	Quantities	Unit prices 1 C	2
Excav, wet	cy	3,084	$5.00	$5.00
Gravel borrow	cy	500	3.00	3.00
Tr timb piles	lf	11,700	2.50	2.00
Cl A c conc, tremie	cy	3,033	25.00	22.00
Cl A c conc, dry pl	cy	2,900	25.00	30.00
Cl A c conc, air-ent	cy	821	35.00	40.00
St reinf, struct	lb	347,000	0.10	0.10
Anch bits	lb	9,000	0.25	0.30
Sawed face gran masy	sf	5,604	9.00	10.00
Tr lumber	Mfbm	52.3	500.00	450.00
Untr lumber	Mfbm	1.25	300.00	300.00
St piles	lf	11,400	6.00	7.00
St pile splices	ea	20	50.00	100.00
St pile load tests	ea	2	2,500.00	2,000.00
Port fld office	ls	1	4,000.00	4,000.00
Clear site & incidl wk	ls	1	3,000.00	5,000.00
Coffordams	ls	1	90,000.00	70,000.00

Superstructure, channel span Charles River Bridge, Boston, Mass.

1C	American Bridge Co., Boston	$781,223
2	Harris Struct. Steel Co., New York	818,782
3	Bethlehem Steel Co., Boston	888,339

Bids 9-26-50 Items	Unit	Quantities	Unit prices 1 C	2
Curb and rail	lf	1,800	$48.00	$55.00
Gutter at curbs	lf	1,800	8.75	9.00
Traf plates at exp jts	lb	48,200	0.311	0.35
St carb st in flr sys & brsg	lb	1,138,400	0.178	0.21
St carb st in cr girders & vert end posts	lb	74,200	0.2135	0.21
St silicon st in cr grdrs & vert end posts	lb	28,200	0.2312	0.2275
St carb st in trusses	lb	461,400	0.2033	0.21
St silicon st in trusses	lb	1,321,300	0.2232	0.2255
St castgs, fixed & exp shoes	lb	27,300	0.3438	0.49
Forgings and pins	lb	48,900	0.3666	0.37
Wr iron troughs	lb	8,700	0.384	0.22
Downspouts, type "A"	ea	8	654.00	448.00
Downspouts, type "B"	ea	4	1,334.00	500.00
Sheet lead	lb	930	0.318	0.60
Fld painting, 1 ct	ls	1	11,400.00	12,480.00

Continued on following page

S·P·E·E·D·I·N·G LINE INSTALLATIONS

In Universal Sewer and U. S. Concrete, pipe advantage carries over to the in-the-ditch costs. Standardization . . . uniformity . . . conformance to specifications increase ease of handling . . . speed line installation. Our policy is to manufacture and sell quality products that are produced in efficient, modern plants. We are always competitive. There is no shortsighted compromise with less than first quality. Eight factories, with large production, serve you.

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Tylox Flexible Rubber Coupled Vitrified Pipe	Ship Lap Wall Coping	Chimney Pots
Aerodrane Filter Block	Septic Tanks	Fire Brick
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• UNIVERSAL SEWER PIPE CORPORATION
• UNITED STATES CONCRETE PIPE COMPANY

• *GENERAL OFFICES* • 1500 Union Commerce Building • CLEVELAND 14, OHIO

Boston expressway

Continued from preceding page

Substructure for single and double deck elevated highway structure, Boston Connection

1C V. Barletta Co., Roslindale 31, Mass. $3,145,672
2 Wes-Julian Constr. Corp., Dedham, Mass. 3,171,891
3 C. J. Maney Co., Inc., Somerville 43, Mass. 3,476,641

Bids 6-12-51 Items	Unit	Quantities	Unit prices 1 C	2
Uncl exc for rdwy	cy	8,350	$1.50	$1.25
Uncl exc for structs	cy	17,500	10.00	7.00
Trench exc, 0-8 ft over 8'	cy	6,700	10.00	8.00
	cy	12,200	5.00	8.00
CB or MH abandoned	ea	24	25.00	20.00
Wet excavation	cy	36,000	1.40	5.00
Ordinary borrow sel for river fill	cy	50,500	1.50	1.15
	cy	112,760	2.00	1.50
Gravel borrow for dredged area	cy	17,100	2.50	1.25
	cy	45,000	2.00	2.00
Sand borrow	cy	200	3.00	4.00
Fine gr, roll & finish	sy	45,000	0.10	0.12
Cr stone for base crs	t	8,200	3.00	2.75
Bit for rdwy base crs	gal	25,000	0.16	0.14
C C base course	cy	300	21.00	20.00
HES C C base course	cy	1,110	23.00	23.00
Calc chl for surf tr	lb	80,000	0.06	0.06
Bit for surf tr, tar for tack coat	gal	7,000	0.18	0.16
	gal	1,000	0.30	0.30
for dust layer	gal	3,000	0.18	0.15
B C for patching	t	200	15.00	10.00
Cl I B C pve, T-1-1	t	2,150	7.50	7.50
Gran block pve, reinid	sy	2,200	5.00	5.00
Lumber sheeting Mfbm		25	300.00	200.00
St pile loading tests	ea	3	3,000.00	5,000.00
Conc pile loadg tests	ea	3	3,000.00	3,500.00
Timber piles	lf	1,650	3.00	2.00
Cl A C C, ftgs. Abtmts, ret. wls, conc. anch bnts	cy	5,900	40.00	35.00
	cy	6,200	40.00	35.00
Cl B cem conc mas	cy	140	35.00	30.00
Cl C cem conc mas	cy	1,200	35.00	20.00
St reinf for structs	lb	1,500,000	0.10	0.10
Bit damp-proofing	sy	3,900	0.60	0.60
Fld st mas in cem. mort.	cy	25	35.00	50.00
Untr lumber	Mfbm	18	500.00	300.00
Slope paving	cy	4,100	8.00	10.00
Maint & rem pres super str.	ls	1	50,000.00	30,000.00
Cip conc piles	lf	103,700	6.00	6.50
Cone test piles	ea	3	400.00	400.00
St piles, dis	lf	34,300	4.00	5.50
St pile splices	ea	80	100.00	150.00
St test piles	ea	3	250.00	200.00
Catch basins	ea	88	200.00	175.00
Manholes	ea	28	210.00	175.00
City of Boston std	ea	16	350.00	300.00
Sp. MH, with C. of B fr & cov	ea	17	1,000.00	1,000.00
Steam serv manhole	ea	1	500.00	1,000.00
CB, C of B std ex cost east	ea	13	350.00	300.00
	ea	13	300.00	250.00
Hoods & gates, C of B st. fl	ea	55	50.00	50.00
CB or MH adj line gr change in type	ea	28	30.00	30.00
	ea	1	100.00	75.00
Fr. & grates or fr. & cov. r&s	ea	12	15.00	10.00
Tide gate MH, C of B std remod	ea	1	400.00	500.00
Fr. & gr, or fr. & cov. r&r	ea	14	40.00	25.00
6" VC pipe	lf	100	2.50	1.50
8" VC pipe	lf	2,100	3.00	1.50
10" VC pipe	lf	50	3.50	2.75
12" VC pipe	lf	80	5.00	3.25
21" VC pipe	lf	180	15.00	10.00
12" RC pipe	lf	1,000	3.00	2.50
15" RC pipe	lf	80	5.00	3.00
18" RC pipe	lf	35	6.00	4.00
24" RC pipe	lf	38	10.00	6.00
36" RC pipe	lf	580	15.00	15.00
60" RC pipe	lf	280	40.00	36.00
66" RC pipe	lf	1,080	60.00	40.00
6" Hvy wt cl pipe	lf	1,000	3.50	3.00
10" Hvy wt cl pipe	lf	200	6.00	4.50
12" Hvy wt cl pipe	lf	100	8.00	6.00
16" Hvy wt cl pipe	lf	100	11.00	8.00
18" Hvy wt cl pipe	lf	30	15.00	10.00
36" Ext hvy wt cl pipe	lf	100	50.00	35.00
10" VC or CC pipe a	lf	1,800	1.50	1.50
12" VC or CC pipe b	lf	1,310	2.00	2.00
15" VC or CC pipe c	lf	400	3.50	3.00
18" VC or CC pipe d	lf	460	4.50	4.00
Lumber platform	Mfbm	2	250.00	300.00
18" tide gate with fr	ea	1	250.00	150.00
36"	ea	1	600.00	350.00
Individual posts	ea	50	8.00	10.00
Ch link fence, 72"	lf	3,800	3.75	4.00
Ch lk g with g posts, 10' wide	ea	4	200.00	100.00
12' wide	ea	3	225.00	125.00
Ind posts rem & reset	ea	50	8.00	5.00
Rem & stacked	ea	50	5.00	2.00
Port barrier fences	ea	12	100.00	50.00
Hwy. gd hvy duty st. bm. type	lf	640	3.25	4.00
Gr. curb, TVA4, straight	lf	4,580	3.15	3.00
TVA4, curved	lf	1,880	4.20	4.00
TVB, str, 5"x18"	lf	2,100	3.75	3.50
Inlets	ea	16	30.00	25.00
Inlets, curved	ea	11	36.00	35.00
Curbing, r&r	lf	600	1.50	1.25
Curbing, r&s	lf	3,200	.75	.50
Curb inlets, r&s	ea	10	8.00	5.00
Curb corners, r&s	ea	44	5.00	5.00
Curb inlets, r&r	ea	2	15.00	10.00
Curb corners, r&r	ea	2	10.00	10.00
Granolithic walks	sy	6,000	4.00	4.00
TI-1 I C walk surf	t	300	10.00	10.00
TBFor CA tr sig cond e	lf	2,500	1.25	1.00
St Signs Rem. & Reset	ea	28	15.00	15.00
Park mat posts, r&s	ea	20	7.00	10.00
Bnds, r&s, let, Gran	ea	50	23.00	25.00
Port off bldgs.	ea	2	4,500.00	2,000.00
Port bldg for san fac	ea	1	4,500.00	4,000.00
Elec substa & pump hse. #1, str.	ls	1	24,000.00	15,000.00
Fire alarm MH	ea	4	400.00	200.00
Serv of water cart for lay dust	day	75	40.00	40.00
Dem. 8 bldgs blk 108	ls	1	30,000.00	40,000.00
3 bldgs blk 109	ls	1	6,000.00	7,500.00
18 bldgs blk 110	ls	1	25,000.00	15,000.00
2 bldgs blk 39	ls	1	7,000.00	5,000.00
1 bldg blk 40	ls	1	1,000.00	1,000.00
13 bldgs blk 41	ls	1	20,000.00	20,000.00
10 bldgs blk 42	ls	1	22,000.00	25,000.00
21 bldgs blk 25	ls	1	35,000.00	50,000.00
9 bldgs blk 24	ls	1	16,000.00	25,000.00
11 bldgs blk 53	ls	1	30,000.00	45,000.00
20 bldgs blk 54	ls	1	32,000.00	50,000.00
2 bldgs blk 76	ls	1	7,000.00	5,000.00
8 bldgs blk 77	ls	1	15,000.00	15,000.00
4" CI water main	lf	160	4.00	3.00
6"	lf	120	5.00	4.00
8"	lf	20	6.00	5.00
12"	lf	1,250	8.00	9.00
16"	lf	1,200	15.00	15.00
20"	lf	1,350	20.00	20.00
24"	lf	60	30.00	25.00
30"	lf	550	40.00	40.00
8" CIP, high pr. fire serv.	lf	130	10.00	10.00
12"	lf	80	16.00	15.00
16"	lf	100	25.00	25.00
8" r&r	lf	200	6.00	5.00
12" r&r	lf	100	7.00	9.00
16" r&r	lf	1,000	12.00	15.00
8" r&s	lf	50	2.00	3.00
12" r&s	lf	50	3.00	5.00
16" r&s	lf	150	5.00	7.00
Hydrant	ea	1	225.00	700.00
Hydrants r&r r&s	ea	11	175.00	100.00
	ea	10	50.00	75.00
1" lead water pipe	lf	500	2.00	1.50
8" gates & gate bxs	ea	8	75.00	100.00
1½" Cocks & serv bxs r&r	ea	3	25.00	50.00
4" G & G bxs, r&r	ea	6	25.00	75.00
6"	ea	9	40.00	100.00
8"	ea	6	60.00	125.00
12"	ea	8	75.00	125.00
12" Gate valve r&r	ea	1	75.00	100.00
16"	ea	8	125.00	150.00
20"	ea	2	150.00	200.00
30"	ea	1	300.00	200.00
6" G valve r&s	ea	2	20.00	50.00
Service boxes	ea	2	25.00	25.00
Curb stops	ea	2	25.00	25.00
Corp cocks	ea	2	25.00	25.00
1" Copper tub type K	lf	200	1.50	1.50
2"	lf	200	2.00	2.50
CI plug for wat mn, 4"	ea	1	10.00	10.00
6"	ea	3	15.00	10.00
8"	ea	1	20.00	10.00
10"	ea	1	20.00	15.00
12"	ea	4	25.00	20.00
16"	ea	2	50.00	30.00
20"	ea	2	100.00	40.00
24"	ea	1	200.00	150.00
30"	ea	1	300.00	200.00
Wat serv conn aban	ea	110	10.00	10.00
MH for 6" water by pass gate C of B std	ea	1	300.00	200.00
MH for 12" wat. gte C of B std	ea	1	300.00	200.00
16"	ea	8	300.00	250.00
20"	ea	2	400.00	500.00
30"	ea	1	500.00	1,000.00
Electrical work	ls	1	4,000.00	6,000.00
Choice of pipe a, b, c, d			cc	cc
Choice of conduit e			ca	ca

* cc cement concrete
* bc bituminous concrete
* fi furnish & instal
* r&r remove & reset
* ca cement asbestos
C of B City of Boston

* sip cast in place
* dip driven in place
* r&s remove & stacked
* bf bituminous fiber
* fs furnish & set

Steel superstructure, single and double deck, Embankment Road Connection

1C American Bridge Co., Boston $2,473,845
2 Bethlehem Steel Co., Boston 2,553,632

Bids 5-15-51 Items	Unit	Quantities	Unit prices 1 C	2
Curb & rail, st	lf	6,150	$68.23	$88.00
Hand rail for ret. wall, st	lf	980	8.54	16.20
Gutter at curbs, st	lf	6,150	11.77	13.80
St traf pl at expn jts	lb	76,000	0.5121	0.452
St carb st for bents	lb	1,825,100	0.2715	0.252
St carb st. for fl sys & brsg	lb	5,100,000	0.2014	0.201
St silicon st. for bents	lb	855,600	0.2873	0.283
Wr iron for troughs	lb	18,800	0.5372	0.479
St supts for dest signs	ls		1 18,790.00	16,630.00
Canopies rebuilt	ls		1 129,700.00	117,860.00
Rdwy lt std on st structs	ea	18	433.00	390.00
on conc. walls	ea	2	470.00	380.00

(Substructure 8 bids 5-18-51, contract to C. J. Maney Co., $1,118,065)

Steel superstructure for single and double deck elevated highway structure, Charleston Connection

1C Harris Struct. Steel Co., New York, N. Y. $3,889,002
2 American Bridge Co., Boston 3,973,947
3 Bethlehem Steel Co., Boston 4,136,148

Bids 4-17-51 Item	Unit	Quantity	Unit prices 1 C	2
Curb & rail, st	lf	9,330	$53.80	$70.00
Hndrl for ret wall, st	lf	905	10.50	9.00
Gutter at curbs, st	lf	9,330	12.00	12.20
St traf pl at exp jts at exp jts at bridges, inst only	lb	154,300	0.285	0.386
	ls	1	2,100.00	1,000.00
St carb st. for bents	lb	3,847,000	0.2275	0.225
St carb st for flsys&br	lb	4,982,500	0.2275	0.219
St silicon st for bent	lb	1,315,000	0.24	0.248
for fl sys & br	lb	3,279,000	0.24	0.24
W I for troughs	lb	28,150	0.315	0.49
Str supts for des signs	ls	1	26,827.50	16,000.00
for its. on Mystic & Charles Riv bridges	ls	1	2,100.00	1,400.00
Fld paint, fin coat, C.R. Br	ls	1	13,000.00	12,200.00
Adj fascia & hand rail, C R & Mystic R brs.	ls	1	37,500.00	6,300.00
Rdwy lt st on st str.	ea	42	432.00	400.00
on conc walls	ea	4	450.00	500.00

(Substructure 9 bids 4-12-51, contract to Berke-Moore Co., Inc., $1,499,978)

Deck, electrical work, snow melting system, Embankment Road Connection

1C V. Barletta Co., Roslindale, Mass. $468,825
2 Berke-Moore Co., Boston 509,170
3 J. F. Fitzgerald Constr. Co., Boston 598,788

Bids 5-15-51 Items	Unit	Quantities	Unit prices 1 C	2
Cl I bit conc pve T1-1	t	1,900	$7.50	$6.50
Cl Aconc, dk, air-ent	cy	2,300	74.00	68.00
Cl A c conc, & ramp slabs, air-ent	cy	915	25.00	38.00
Cl D c conc wkwy, superstr, air-ent	lf	6,150	2.00	2.00
St reinf. for structs	lb	899,000	0.10	0.10
Downspouts & latls	ls	1	25,000.00	31,640.00
Membr waterprfg	sy	11,800	2.50	2.25
Gunite	sf	1,900	2.00	2.00
Snow melting sys	ls	1	69,000.00	81,500.00
Destination signs	ls	1	7,500.00	7,500.00
Fire prot piping	ls	1	4,000.00	4,910.00
Electrical work	ls	1	41,000.00	68,000.00

Deck, electrical work, snow melting, Charleston connection

1C Berke-Moore Co., Boston, Mass. $775,858
V. Barletta Co., Roslindale, Mass. 780,520
S. Volpe & Co., Inc., Boston, Mass. 945,050

Bids:4-17-51 Item	Unit	Quantities	Unit prices 1 C	2
Cl I bit conc pve T I-1	ton	3,550	$6.50	$8.50
Cl A c conc deck, air-ent	cy	4,820	68.00	72.00
Cl D c conc wkwy, superst	lf	10,850	2.00	1.50
St reinf for struct	lb	1,480,000	0.10	0.10
Downspouts & laterals	ls	1	49,100	45,000
Membrane waterproofing	sy	24,000	2.25	2.00
Gunite	sf	5,100	2.00	1.50
Portable barrier fences	ea	10	50.00	100.00
Hwy gd hvy duty st bm T	lf	348	4.00	4.00
Destination signs	ls	1	8,600	7,000
Fire protection piping	ls	1	4,540	12,000
Elect wk snow control wiring on ramps & runways	ls	1	130,000	120,000

Divided highway, N. J.

Five bids, all below the engineer's estimate, were received June 12 by the New Jersey State Highway Department at Newark for constructing 2.233 mi. of 4-lane, divided highway, N. J. Route 6, from Pine Brook relocation to Little Falls Road, Caldwell Township, Essex County. F. M. Beck is district construction engineer.

The low bid, $1,973,454, took the contract. Work started June 26 and had to be completed in 175 working days. The penalty for delays beyond this time is 0.02 of 1% of the contract price per day.

Continued on following page

Divided highway, N. J.

Continued from preceding page

The job included four bridges, two of them overpasses over existing roads and two jump-overs.

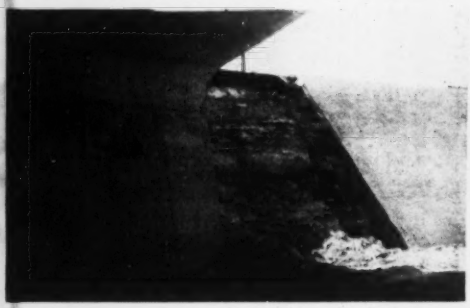
Wages prevailing are $1.85 for common laborers, $2.50 for hand-tool operators and cement finishers, $2.625 to $3.75 for power equipment operators.

The highway skirts the Wright Aeronautical plant and cuts off part of the employee parking lot. In return, the contractor will build a new parking lot across the road and will construct a pedestrian underpass from the new lot to the plant.

Bidders include:

1C	Franklin Contracting Co., Newark, N. J.	$1,973,454.14
2	Villa Contracting Co., Inc., Westfield, N. J.	1,994,049.67
5	George M. Brewster & Son Inc., Bogota, N. J.	2,364,781.10

Bids 6-12-51 Items	Unit	Quantity	Unit prices 1 C	2
Field office	ea	1	$2,400	$3,680
Clearing site	ls		37,000	24,000
Stripping, 6"	A	18	365.00	325.00
Stripping, 12"	A	17	590.00	625.00
Roadway excavation, earth	cy	17,573	0.68	0.60
Roadway excavation, rock	cy	100	10.00	5.80
Wet excavation	cy	40,356	1.29	0.75
Pavement exc	sy	3,622	1.18	1.00
Borrow excavation	cy	327,506	0.84	0.87
Porous fill	cy	4,386	1.60	1.50
Ditch excavation	cy	2,740	1.80	2.25
Sub base	cy	38,829	1.60	1.15
Sub grade	sy	82,048	0.20	0.25
Stone shoulder, 8" thick	sy	32,624	1.20	1.42
4" topsoiling	sy	67,339	0.40	0.45
6" topsoiling	sy	64,182	0.45	0.55
Macadam base course, 4"	sy	2,382	0.80	0.85
Macadam base course, 6"	sy	3,882	1.10	1.30
Watbnd mac base crse, 5"	sy	2,793	1.25	1.35
Conc base course, 8"	sy	18,707	3.60	4.50
Pen. mac. sur. crse, hot 3"	sy	2,793	0.60	1.00
Bituminous material	gal	7,400	0.16	0.15
Pen. mac. 3d hot appl	sy	2,793	0.16	0.15
Pavement, type MABC-1, 2"	T	2,150	12.00	14.10
Fine aggregate seal coat	T	49	12.00	10.00
Pavement, type A or T, 2"	T	800	9.50	11.40
Pavement, type SP-1	T	3	30.00	14.10
Conc pave surf pl, 6"	sy	10	5.00	5.05
Conc pave surf rein 10"	sy	62,056	5.50	5.80
Br appr slabs, rein 18"	sy	500	12.40	17.30
Conc pave surf rein 14"	sy	631	8.10	10.40
Dowel type trans jnts	lf	7,177	3.00	3.60
T-and-g transv jts	lf	12	4.00	3.50
Br stone or washed grav	cy	270	6.00	8.40
Cl C conc pipe plugs & steps	cy	2	100.00	100.00
Reset conc chocks	ea	206	3.45	1.85
Underdrain, Type F	lf	1,500	2.40	3.40
6" clay pipe	lf	115	4.00	2.15
12" RC pipe	lf	81	5.00	4.50
18" RC pipe	lf	6,476	5.20	6.05
24" RC pipe	lf	498	7.00	7.70
30" RC pipe	lf	74	14.00	9.90
12" CI pipe	lf	10	10.00	7.85
18" CI pipe	lf	1,097	11.50	11.40
24" CI pipe	lf	258	19.00	17.65
30" CI pipe	lf	85	32.00	28.80
6" CM pipe	lf	751	2.40	2.30
Relay 12" CI pipe	lf	110	6.80	6.00
Guard fence posts, 6"x8"x7'	ea	20	14.40	17.20
Manholes	ea	2	240.00	190.00
Inlets, Type A	ea	12	230.00	200.00
Type B	ea	121	268.00	265.00
Type E	ea	2	310.00	265.00
Type B, exist. catge	ea	2	190.00	175.00
Reset inlet heads	ea	2	30.00	35.00
9"x20" wh conc vert curb	lf	17,218	2.42	2.60
18" x 8" wh conc sloping curb	lf	2,002	2.22	2.40
9" x 11" wh conc vert curb	lf	1,244	2.00	2.30
Reset 12" precast conc curb	lf	276	2.20	2.25
Conc sidewalk, 4" thick	sy	70	4.58	4.70
Headwalls	cy	90	100.00	86.00
Culverts, Cl B conc	cy	97	118.00	92.00
Monuments	ea	23	18.00	24.50
Br appr slabs reinf 12"	sy	154	11.50	10.40
Wire-rope fence	lf	9,941	2.42	2.45
Guard fence anchorages	ea	71	92.00	110.00
Reset wire-rope fence	lf	100	1.34	1.60
2 1/2" GWI pipe conduit	lf	1,268	3.00	3.05
18" x 36" conc. junct boxes	ea	35	115.00	84.00
Calcium chloride	T	10	89.00	89.00
Ea excav, subsur struct	cy	50	6.00	6.00
Communication inst.	ls		2,500	2,700
Peat humus	T	1,138	17.25	16.00
Mulching, hay	sy	25,017	0.05	0.08
Found excavation	cy	2,463	4.00	5.00
Cl B conc in struct	cy	1,331	75.00	62.00
Cl C conc in struct	cy	5,128	45.80	42.00
Concrete balustrade	lf	1,329	17.00	13.80
Structural steel	lb	1,358,400	0.13	0.15
Reinf st in struct	lb	327,630	0.17	0.17
Waterproofing	sf	1,379	1.50	1.00
Timber piles	lf	18,820	1.55	1.75
Pull box fr and cov	ea	22	70.00	90.00
Cast st lettering panels	ea	8	125.00	150.00
8" perf CM pipe	lf	800	4.00	3.50
8" CM pipe	lf	475	4.00	3.35
Light sys at crossover	ls		4,660	3,000
underpass	ls		4,790	3,000
underpass	ls		4,660	3,000
crossover	ls		4,660	3,000
Test piles	ea	12	200.00	300.00



Overpass structures and paving, Travis County, Texas

On 2.2 miles of grading, overpass structures, flexible base and hot mix asphaltic concrete pavement in Travis County, Texas the contract was let for $964,981. Five contractors submitted bids July 17 with the high only 11% above the low bid. R. H. Fincher, District Fourteen, Texas Highway Department, Austin, is the engineer.

Four 72-ft rigid frame overpass structures are of unusual design with inside faces cast on forms lined with corrugated metal. Retaining walls on sections in cut are reclining type with ¾ to 1 slope, also with face forms lines with corrugated metal and concrete poured against rock back-slope instead of a back form.

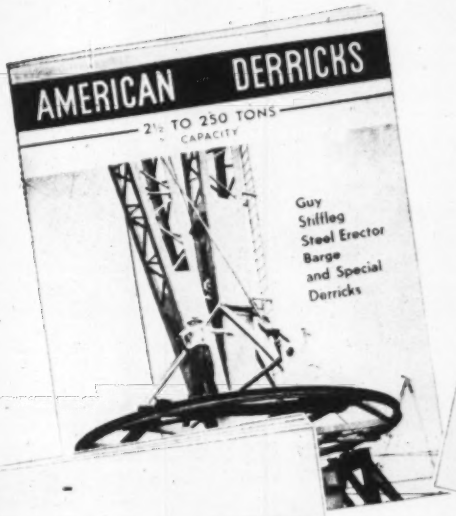
The State furnishes concrete aggregate, otherwise all materials are to be furnished by the contractor. Work started August 8 with completion date set at 300 days. The job is two miles from a rail head.

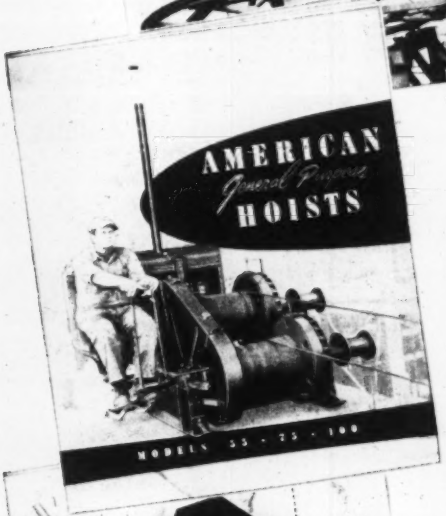
Minimum wage rates to be paid are for skilled labor, $1.50 per hour; for semi-skilled, $1.00 and for common labor, $0.75.

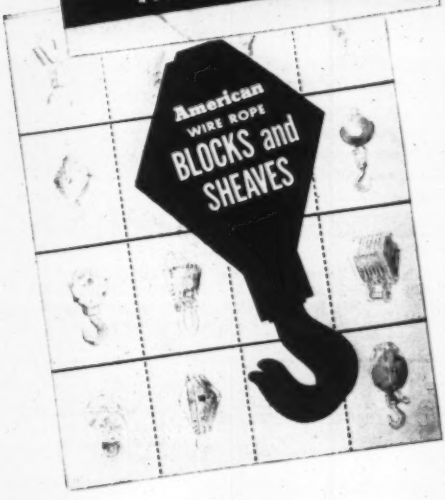
Bidders include:

1C	McKown & Sons & Pace-Spence Co., Austin.	$964,981
2	Collins Constr. Co. of Texas, Austin	986,040
5	H. B. Zachry Co., San Antonio	1,073,183

Bids 7-17-51 Item	Unit	Quantity	Unit prices 1 C	2
Clear & grub	ac	11.5	$295.00	$300.00
Uncl rd exc	cy	198,894	0.58	0.59
Uncl chan exc	cy	4,600	0.68	0.75
Uncl str exc culvs	cy	1,871	4.00	4.00
Storm sew	cy	13,289	3.15	3.00
Bridges	cy	1,409	7.00	7.00
Ret. walls	cy	245	10.00	10.00
Sprinkling	mg	8,991	1.00	1.10
Rolling	hrs	483	4.00	3.50
Rolling	hrs	1,711	4.00	5.00
Rolling	hrs	1,711	4.00	3.50
Flexible base	cy	116,061	1.55	1.63
Asph. material (MC-1)	gal	38,562	0.15	0.16
Asphalt	ton	925	29.00	26.00
Aggregate (Type C)	ton	18,713	4.73	5.00
Tack coat	gal	9,883	0.20	0.16
Cl "A" conc. culvs	cy	1,347.08	40.00	40.00
Bents	cy	139.52	38.00	38.00
Slabs	cy	215.26	38.00	38.00
Rigid frame	cy	1,045.92	40.00	40.00
Ret walls	cy	1,061.74	31.00	31.00
Reinf steel	lb	551,300	0.10	0.10
Struct steel	lb	233,294	0.13	0.13
15" std pipe	lf	2,474	3.80	3.00
18"	lf	3,806	3.95	3.75
24"	lf	3,197	4.80	5.00
30"	lf	1,066	6.55	6.00
36"	lf	1,950	7.55	7.50
42"	lf	150	7.95	9.00
48"	lf	1,412	12.85	11.40
Relay culv pipe over 18" dia	lf	167	3.80	3.00
Drilled Shafts, 30" dia	lf	98	30.00	30.00
Railing, Type A	lf	295.85	10.00	10.00
Railing, Type B	lf	170.67	12.00	12.00
Cl B Conc. rip rap	cy	142.83	32.00	32.00
Remov old struct	ea	8	10.00	50.00
6" pipe underdr, conc	lf	2,190	2.50	2.50
Mulch Sodding	cy	8,662	1.35	1.50
Fertilizer	ton	3.25	90.00	100.00
Concrete curb	lf	15,182	1.06	1.05
Conc curb & gutter, ty. A&B	lf	40,461	3.10	3.20
Conc curb & gutter, ty. C	lf	14,931	1.15	1.25
ROW Markers, Type 2	ea	9	5.00	4.00
Sidewalks	sy	18	3.50	3.50
Sdwks & driveways	sy	1,018	3.25	3.50
St pl gd fence, ty 5 or 6 mod	lf	3,080	3.68	3.00
Curb inlet, ty A	ea	9	125.00	125.00
Ty B	ea	56	125.00	180.00
Ty D	ea	13	125.00	140.00
Ty E	ea	26	125.00	180.00
Grate & fr inlet ty A	ea	2	125.00	150.00
Ty B	ea	4	125.00	180.00
Manholes	ea	28	275.00	250.00
2" fibre conduit	lf	844	0.75	2.50
Wall gutter	lf	945	1.50	1.50
4" conc pipe	lf	197	1.00	1.00
Conduit	lf	348	1.00	1.00
Conc med slab	lf	7,348	0.75	0.80







REQUIRED READING

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How many thousands of dollars could *you* have saved in the past ten years, with better "how-to-buy" knowledge of equipment? Actually, the money saved by getting the *right size*, the *right type* of equipment may be your biggest single source of extra profits.

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positive corrosion protection at lower yearly cost

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with pure metallized zinc and aluminum

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The Metco Systems, a new series of 18 basic engineering specifications developed by Metallizing Engineering Co., cover the protection of structures and equipment under a wide range of corrosion conditions, including immersion in salt or fresh water of various pH values; exposure to water ballast, condensate and some mild acid solutions, and to salt, humid, rural and industrial atmospheres ranging from light to heavy.

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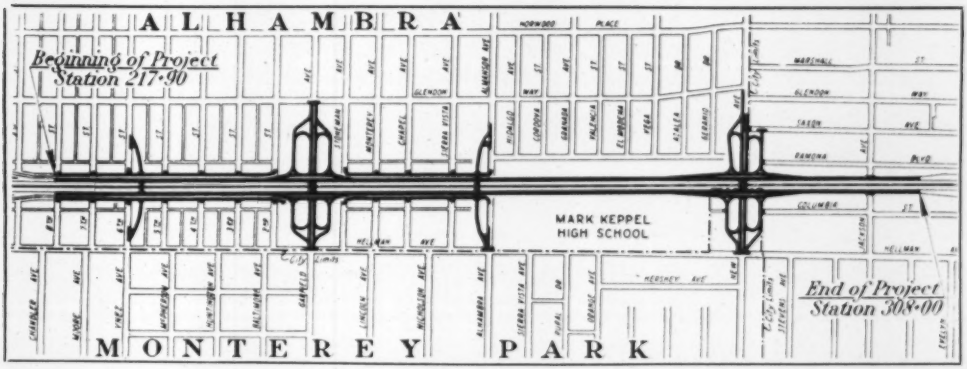
Metco System contractors

New Orleans 13, Louisiana **GULF ENGINEERING CO., INC.** 1000 South Peters Street Tel. Canal 4421	**Newport Beach, California** **CLARK METALLIZING, INC.** 506 – 30th Street Tel. Harbor 2509	**Barberton, Ohio** **AKRON SAND BLAST CO.** 50 E. Springfield Rd. Tel. Plaza 3412	**Buffalo 1, N. Y.** **METAL-CLADDING, INC.** Lakeview & Porter Avenues Tel. Elmwood 9536
Lincoln Pk. 25 (Detroit), Mich. **DIX ENGINEERING CO., INC.** 1417 Dix Road Tel. Dunkirk 1-8822	**Philadelphia 29, Pa.** **METALWELD, INC.** Fox & Hunting Park Ave. Tel. Radcliff 5-3471	**St. Louis, Missouri** **NOOTER CORPORATION** 1420 South Second Street Tel. Main 6000	**Brooklyn, N. Y.** **ARTHUR TICKLE ENGINEERING WORKS, INC.** 21 Delevan Street Tel. Main 5-4200	**Houston, Texas** **F. W. GARTNER CO.** 3805 Lamar Avenue Tel. Atwood 5338



Ramona Freeway, Los Angeles County, Calif.

Cost of freeway construction should be well known in the Los Angeles area where a huge program of such work is well underway. A 1.7-mi section of the Ramona Freeway, between Eighth St. and Jackson Ave. drew three bids, opened Sept. 6, 1951 by G. T. McCoy, State Highway Engineer, Div. of Highways, Los Angeles.

Graded and paved with Portland cement concrete on cement treated subgrade and with plant-mixed surfacing on imported base material, this section includes three undercrossing and underpass structures, one overpass bridge, one pedestrian undercrossing, and provides a 6-lane divided highway with frontage roads.

Combination reinforced concrete slab and structural steel beam spans are used at Sixth St., 48′ long, at Garfield Ave., 83′ long, and at New Ave., 84′ long to carry Ramona Freeway and the tracks of the Pacific Electric Railway. Roadway widths of 41′ and 40′ will be provided for the Freeway and widths of 30′ and 28′ for the collector roadways. The Almansor Ave. overhead crossing will be a welded-plate girder with reinforced concrete deck about 270′ long. The pedestrian undercrossing at Jackson Ave. will be two reinforced concrete box sections 168′ long including ramps with 5′ sidewalks. Completion time is 400 working days.

Wage rates prevailing include the following: skilled labor $2.75, semi-skilled, $2.10, common, $1.75. Carpenters get $2.35, cement dumper, $1.95; concrete or asphalt spreading, tamping or finishing machine operators, $2.30; electricians, $2.75; pneumatic tool operators, $1.95; reinforcing iron workers, $2.38; structural iron workers, $2.50; sewer pipe laver, $2.05, caulker using caulking tools, $1.93, caulker, cement joints, $1.80; tractor operator, with attachments, $2.30; trenching machine operator, $2.38.

Bidders include:

1C Griffith Co., Los Angeles, Calif. $2,381,815
2 J. E. Haddock, Ltd., Pasadena, Calif. 2,517,883
3 United Concrete Pipe Corp., Baldwin Park, Calif. 2,628,920

Bids: 9-6-51		Quan-	Unit prices		
Items	Unit	tity	1 C	2	
Remov concrete	cy	3,040	$3.75	$5.00	
Clear & grubbing	ls		24,000.00	40,000.00	
Roadway excavation	cy	225,000	0.54	0.75	
Struct exc, bridges	cy	5,960	1.50	2.50	
Struct bf, bridges	cy	10,410	2.80	2.00	
Struct exc	cy	44,380	2.10	2.20	
Compact orig grnd	sy	106,000	0.04	0.03	
Overhaul	sta y	300,000	0.005	0.005	
Imported base mat'l	ton	117,000	1.17	1.18	
Imported perv mat'l	ton	10,000	1.70	1.60	
Prep slopes, eros contr.	sy	19,000	0.11	0.85	
Cult, prep landscap.	sy	38,000	0.07	0.04	
Dev wat sup & furn wat equip	ls		5,200.00	15,000.00	
Applying water	M gal	11,000	1.50	1.25	
Finishing roadway	ls		3,000.00	2,000.00	
Mix & comp, CT subgr	sy	88,000	0.26	0.20	
Prime ct, CT subgrade	bbl	4,200	3.85	3.40	
Liq asph, SC-2, pr ct.	ton	85	27.00	25.00	
Asph emul, pt bdr, seal cts & curing sl	ton	130	45.00	45.00	
Min agg, PMS	ton	14,500	4.15	4.15	
Paving asph, PMS	ton	750	4.15	4.15	
Raised traffic bars	lf	150	1.25	1.00	
Screenings, sl ct	ton	23	4.00	6.25	
Sand, sl ct	ton	210	3.60	4.50	
PC conc, pavement	cy	21,000	11.00	11.50	
Pave lip hold assemb	ea	17,500	0.62	0.60	
Cl "A" PC conc, struct	cy	11,710	40.00	44.00	
Rubber waterstops	lf	1,680	2.20	2.15	
Bar reinf steel	lb	1,497,000	0.10	0.106	
Misc iron & steel	lb	73,140	0.31	0.34	
Struct steel	lb	483,000	0.15	0.145	
Str st, Almansor Ave br.	lb	344,000	0.20	0.18	
Cl & paint struct st	ls		11,000.00	12,000.00	
Furn conc railing	lf	22,000	3.25	3.20	
Driving piles	ea	800	55.00	60.00	
PCC erbs, gtrs & swks	cy	6,800	25.00	23.00	
Steel railing	lf	3,132	8.75	8.30	
Wall handrailing	lf	389	7.00	6.00	
Exter handrailing	lf	248	12.00	10.00	
Metal stair treads	lf	812	2.15	2.00	
Open steel floor & supts.	ls		1,000.00	900.00	
Washing equip	ls		300.00	500.00	
Protective cover	sy	810	1.00	1.20	
Memb waterprfg	sy	844	3.00	3.50	
Chain link fence	lf	24,290	2.25	2.15	
Salv exist ch lk fnc	lf	1,080	0.55	0.60	
Reconst salv ch lk fnc	lf	1,050	0.55	1.00	
12" RC pipe, std str.	lf	120	2.70	3.40	
18" std str.	lf	5,950	4.00	4.70	
21", std str.	lf	450	4.70	5.70	
24", std str.	lf	2,170	5.40	6.50	
30", std str.	lf	370	7.20	8.50	
30", ext str.	lf	40	8.50	10.30	
33", std str.	lf	2,270	8.00	9.60	
33", ext str.	lf	40	10.00	11.80	
36", std str.	lf	3,460	9.00	10.80	
36", ext str.	lf	40	11.00	13.20	
42", std str.	lf	450	12.00	14.00	
48", std str.	lf	1,000	14.00	16.50	
48", ext str.	lf	40	15.50	19.00	
60", std str.	lf	230	19.00	22.00	
29"×18" CMP arch, 14 ga.	lf	4,850	5.20	8.60	
10 ga.	lf	1,070	9.60	12.30	
6" PM pipe, 18 ga.	lf	864	1.60	2.30	
8" underdr.	lf	160	2.00	2.30	
Salv exist pipe arch culv.	lf	250	1.20	1.50	
Relay salv CMP arch.	lf	250	1.20	2.50	
Pipe shaft manholes	lf	80	15.00	15.00	
Met plate guard rail	lf	1,920	3.30	3.00	
Sanitary sewers					
4" Cl sewer pipe	lf	1,650	5.30	4.20	
8" Cl sew, std str.	lf	6,800	4.10	3.60	
10" Cl sew, ext str.	lf	2,750	7.40	5.25	
Manholes, san sew.	ea	37	230.00	200.00	
Drop manholes, san sew.	ea	6	300.00	400.00	
Flush MH, san sew.	ea	6	230.00	275.00	
Adj MH to gr san sew.	ea	4	25.00	30.00	
Aband MH, san sew.	ea	44	40.00	50.00	
Remod MH, san sew.	ea	2	170.00	100.00	
House conn caps	ea	42	12.00	25.00	
Pumping, electrical, lighting & signal systems					
Drain pump equip, 6th St	ls		4,400.00	4,400.00	
Garfield Ave.	ls		7,500.00	7,500.00	
Pmphse sl equip, 6th St.	ls		2,400.00	2,300.00	
Garfield Ave.	ls		4,800.00	4,500.00	
Traf signal, hwy ltg & illum sign sys	ls		125,000.00	120,000.00	

* IBM imported base mat'l * CT cement treated
* PMS plant mixed surfacing

Hydraulic embankm'nt, Ore.

The Hood River-Mosier Section, Columbia River Highway along the south edge of Columbia River is 6.96 mi of hydraulic sand fill, 45 ft wide with a variable depth of 10 to 35 ft and 3:1 slopes. Rock slope protection and surfacing under separate contract will give a minimum 50-ft width. This new water-grade highway will replace the old narrow, winding route through the Cascade mountain range. The new grade is mostly in shallow water, 0 ft to 20 ft in depth and is being built high enough that high water will not affect traffic. The line has few curves, from 1° to 4° and the grade is practically level. Sand bars located adjacent and parallel to roadbed are suitable for hydraulic embankment and have been made available to the contractor. R. H. Baldock is State Highway Engineer, A. V. Benedist, The Dalles, Oregon, is resident engineer for the Oregon State Highway Commission.

The General Construction Company is using a 22-in electric-powered dredge and pipeline varying from 2,000 ft to 8,000 ft. Electric power is supplied from the Bonneville hydroelectric power station when practical and, when not, a diesel-powered generator mounted on a barge is used.

Work started April 12, 1951 and is to be completed May 31, 1952.

Continued on following page

LEADERS

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HENDRIX DRAGLINE BUCKETS are specified by leading earth-moving contractors . . . operators who want their equipment to take plenty of punishment and produce plenty of profits from the time it goes into operation!

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HENDRIX *Lightweight* **DRAGLINE BUCKETS**

HENDRIX MANUFACTURING CO., INC.

MANSFIELD – LOUISIANA

Hydraulic embankm'nt, Ore.

Continued from preceding page

The job is adjacent to a railroad. Bids were opened April 12. Minimum wages are set at $1.00 for common labor up to $1.40 for skilled, but the job is paying union scale of $2.25 to $3.00 for skilled labor, $1.80 to $2.35 for semi-skilled and $1.75 to $1.90 for common labor. Rail, highway and water transportation to the job are all available.

Bidders were:

1C General Construction Co., Portland, Ore.	$1,074,350
2 Manson Constr. & Engr. Co. & Osberg Constr. Co., Seattle, Wash.	1,226,810
3 Puget Sound Bridge & Dredging Co., Seattle, Wash.	1,295,994

Bids: 4-12-51 Items	Unit	Quantity	Unit prices 1 C	2
Hyd embank in pl	cy	4,500,000	$0.225	$0.26
Extra for steep slope embank	cy	25,000	0.30	0.70
Exc struct, unclassified	cy	1,300	10.00	3.00
CM pipe, protect invert				
18"	lf	370	6.00	5.00
18" extra strength	lf	560	7.00	5.50
24"	lf	220	8.50	6.00
24" extra strength	lf	200	10.00	7.00
36" extra strength	lf	630	18.00	12.00
42" extra strength	lf	1,000	20.00	20.00

Rock toe embankment and grading

1C Kuckenberg Constr. Co., Portland, Ore.	$861,190
2 McNutt Bros. Co., Eugene, Ore.	708,020
8 Guy F. Atkinson Co., Portland, Ore.	846,930

Bids: 2-26-51 Items	Unit	Quantity	Unit prices 1 C	2
Clear & grub	ls		$5,000	$9,000
Gen'l exc. common	cy	420,000	0.43	0.53
solid rock	cy	300,000	0.95	0.96
Short overhaul	sta y	2,946,000	0.015	0.02
Long overhaul C	sta y	219,000	0.60	0.50

Topping and slope protection

1C Parker Schram Co., Portland, Ore.	$479,600
2 Sather & Sons, Yardley, Wash.	518,960
10 McNutt Bros., Eugene, Ore.	820,720

Bids: 7-16-51 Items	Unit	Quantity	Unit prices 1 C	2
Loose rock exc	cy	180,000	$0.55	$0.55
Solid rock exc	cy	230,000	1.00	1.15
Short overhaul	sta y	2,400,000	0.01	0.01
Long overhaul C	sta y	220,000	0.45	0.43
Exc & plac top soil	cy	26,000	0.50	0.55
Hauling topsoil	y mi	48,000	0.20	0.22
Prep, fert, seed grass areas	ac	40	125.00	300.00

Paving, Winchester, Ill.

Prices bid on street paving for the Village of Winchester allow for discounting of bonds received by the contractor in payment for improvements done on a special assessment basis. Consoer, Townsend & Assoc., Chicago, Ill. are engineers. The job was awarded June 14 to the lower of two bidders. Work had to start within 30 days of notice to proceed and be completed in 100 consecutive calendar days. The job is 5 miles from the rock quarry. Wages to be paid are $2.85 to $2.25 for skilled and $2.00 for common labor.

Bidders were:

1C Geo. D. Hardin, Chicago, Ill.	$209,893
2 Robt. A. Black, Chicago, Ill.	214,485

Bids: 5-22-51 Items	Unit	Quantity	Unit prices 1 C	2
Exc, earth, 2' Aver	cy	14,000	$0.62	$2.30
Curb & gutter, 18"	lf	21,800	2.17	2.00
WBM base, 8"	sy	27,300	1.55	1.50
Bit surf, 2"	sy	27,300	1.53	1.45
Inlets	ea	42	113.00	140.00
Pipe connections, 8"	lf	1,260	4.50	3.00
MH Adjust'd	ea	49	23.00	30.00
PCC sidewalk, 5"	lf	18,800	3.10	2.50

Swing bridge, N. Car.

A 250-ft, copper bearing steel swing span provides two 90-ft channels for navigation through a 3,683-ft bridge being built by North Carolina State Highway & Public Works Comm. over Bogue Sound between Morehead City and Atlantic Beach, North Carolina. Approach spans are 35 ft, of reinforced concrete. Precast concrete pile substructure is used throughout with precast concrete sheet pile bulkheads. The roadway is 24 ft with 3-ft walk on each side. Fenders for channels are creosoted timber. Bids were opened May 8, 1951 and award was to the low of two bidders at $1,377,672. J. B. Cutchin is resident engineer at New Bern, N. C.

Work includes forming, casting and driving concrete piles, forming

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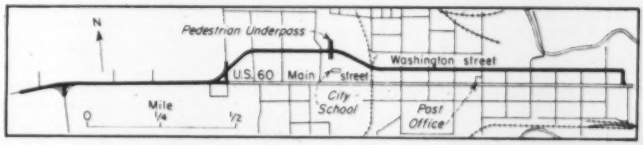
High-type surfacing, relief route, Shelbyville, Ky.



Construction on US 60 of a relief route around Main St., Shelbyville, was let June 22 on a combination bid at $389,240 by Kentucky Department of Highways, D. H. Bray, State Highway Engineer, W. F. Knarr, district engineer, Louisville and Frank Mattingly, resident engineer, Shelbyville.

One section requires contractor to grade, drain, pave with cement concrete 22 ft wide, the other section requires him to grade, drain, and pave with bituminous concrete 40 ft wide. This will be one block north of present route and will probably be for westbound traffic. With other work under contract this will make US 60 a 4-lane route from Shelbyville to Louisville.

Work started Aug. 10 and must be completed by June 30, 1952. The railroad freight station is two blocks north of the job. All materials are furnished by the contractor. He will supply corrugated metal pipe for entrance pipe and reinforced concrete pipe for culverts.

A 110-ft long pedestrian underpass will be constructed for access to the high school football field.

Wages to be paid range from $2.30 for skilled labor through $1.50-2.10 for semi-skilled to $1.00 per hr for common labor.

Bidders include:

1C H. C. Adams, Lexington, Ky.	$389,240
2 The Fuller Davies Co., Covington, Ky.	404,215
6 Foster & Creighton, Nashville, Tenn.	460,757

Bids: 6-22-51 Items	Unit	Quantity	Unit prices 1 C	2
Clear & grub	ac	15.88	$75.00	$125.00
Roadway exc	cy	36,115	0.80	0.70
Struct exc, unclassified	cy	724	6.00	5.50
common	cy	1,010	3.00	3.50
solid rock	cy	70	10.00	15.00
Overhaul	y sta	21,801	0.03	0.03
Rem trees or stumps	ea	71	50.00	60.00
hedge fence	lf	1,867	0.50	0.70
curb	lf	40	1.00	1.00
curb and gutter	lf	8,591	0.25	0.25
shrubs	ea	42	5.00	5.00
brick sidewalk	sy	32	1.00	1.00
conc sidewalk	sy	4,373	0.45	0.35
conc pave	sy	299	1.50	0.80
headwalls	ea	5	10.00	7.00
wet stone masnry posts	ea	4	50.00	30.00
Rebldg wet st masnry posts	ea	4	250.00	120.00
Ram catch basins	ea	20	25.00	15.00
manhole	ea	2	25.00	20.00
conc masnry	cy	38	10.00	10.00
wet stone masnry	cy	32	10.00	5.00
dry stone masnry	cy	0	5.00	5.00
iron fence	lf	434	0.50	0.40
pipe	lf	531	1.00	1.50
Relaying pipe	lf	78	1.00	1.50
Reset trees	ea	3	100.00	40.00
hedge fence	lf	978	0.50	0.80
iron fence	lf	434	1.00	1.00
Adj MH cov to gr	ea	18	20.00	15.00
Stone paving	sy	100	5.00	4.00
Cl A conc	cy	348.96	50.00	50.00
Cl B conc	cy	115.00	45.00	47.00
St reinf	lb	28,218	0.15	0.13
2" galv pipe hndrl type B	lf	334	6.00	7.00
2" type A	lf	240	3.50	3.50
4" concrete sidewalk	sy	7,089	4.00	3.25
Brick sidewalk	sy	7	5.00	4.00
Wet stone masonry	cy	61	40.00	35.00
Ch link fence, 7' high	lf	680	3.50	5.00
4' high	lf	506	2.00	3.00
look gates	ea	4	100.00	250.00
Temporary cross overs	ea	4	150.00	125.00
Water	100 gal	1,980	0.25	0.20
Project monument	ea	3	40.00	40.00
Final dressing	100' sta	113	25.00	20.00
Electric lighting	ls	1	250.00	500.00
Seeding & protect	sy	29,991	0.12	0.10
Agri grnd limestone	ton	13.5	7.50	7.00
Comm fertilizer	ton	2.7	100.00	90.00
Sodding	sy	2,606	0.75	0.90
Halls honeysuckle	ea	75	1.00	0.80
6" C conc pave, entr	sy	944	4.25	4.00
4" V C tile pipe	lf	11	2.50	2.00
4" Clay drain tile	lf	6	3.50	1.80
6" Ex qual dr tile	lf	40	3.75	2.25
8"	lf	6	4.00	2.50
Cast iron drain	ea	1	250.00	150.00
15" entrance pipe, CM	lf	291	3.00	2.50
18"	lf	309	3.50	3.25
24"	lf	24	5.00	4.25
Manholes	ea	13	250.00	250.00
12" Crb & gut box inl type 2	ea	9	250.00	200.00
15"	ea	16	275.00	225.00
18"	ea	12	300.00	260.00
24"	ea	2	350.00	300.00
30"	ea	1	500.00	350.00
12" Valley gut box inl	ea	1	150.00	150.00
15"	ea	7	150.00	175.00
30"	ea	1	300.00	200.00
Curb outlet basin	ea	1	200.00	125.00
15" rural pipe inlet	ea	2	100.00	150.00
12" Culvert pipe, RC	lf	522	2.50	2.50
15"	lf	1,065	3.00	3.00
18"	lf	1,473	3.50	3.50
24"	lf	117	5.00	5.00
30"	lf	207	6.50	7.00
36"	lf	72	9.00	8.50
2' Valley gut pipe inl	ea	1	150.00	125.00
Cement concrete pavement				
Cr limestone, insul	ton	6,883	2.75	2.70
C conc pave	sy	30,390	3.80	4.44
Cr limestone for entr	ton	400	3.00	2.70
Integral curb	lf	9,281	0.60	0.50
Header curb	lf	700	1.50	2.00
Lip curb	lf	430	0.50	0.40
Bit concrete base—binder and surface Cl 1				
Cr limestone, insul	ton	390	3.00	3.00
C conc base	sy	8,112	4.10	4.30
Bit conc base	ton	2,066	8.00	8.00
Bit matl (PAC-5) for prime	gal	3,950	0.20	0.20
Bit conc binder	ton	1,475	8.00	8.00
Bit conc surf type B	ton	1,480	8.00	8.00
Curb and gutter	lf	175	3.00	3.00
Form & shap bit lip curb	lf	450	0.50	0.30
Integral curb	lf	15,351	0.50	0.80

From Beef

FORT WORTH DIVERSIFIES INDUSTRY; MAKES

DEEP IN THE HEART OF TEXAS, Fort Worth has been justly famed as "Cowtown" since the days of the old Chisholm Trail. While still the leading meat packer and grain processor of the South, Fort Worth also has become much more than that.

Located in the leading mineral and oil producing state, the city has a population of 277,047 with *over 600* manufacturers of a great range of products. An especially important product is the 10-engined B-36, the Air Force "Big Stick."

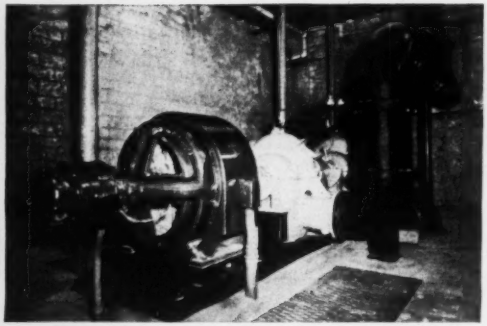
Allis-Chalmers pumps and motors play a large part in the vital transport of Fort Worth's water. Of the Booster stations' total capacity of 85½ million gallons a day, A-C equipment handles 65½ M.G.D.!

Fort Worth knows the importance of an adequate water supply to an even bigger future and is now engaged in a waterworks expansion program. When completed, four reservoirs will provide a storage capacity of 620,660 acre feet . . . enough for the personal and industrial needs of a million people!

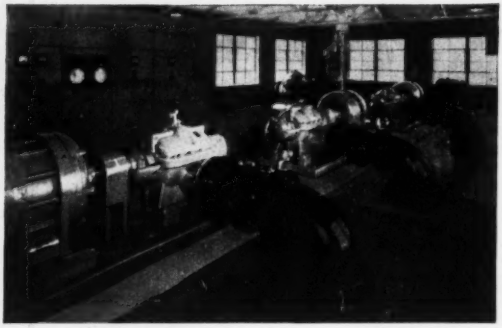
If *you* are planning on expansion or modernization, do as Fort Worth and other leading cities are doing — take advantage of Allis-Chalmers knowledge and facilities for handling municipal pumping problems. Call your nearest A-C sales office or write to Allis-Chalmers, Milwaukee 1, Wisconsin for Bulletin 52B6059G.

A-3456

Relies on Allis-Chalmers Equipment for Water



MAIN PUMPING PLANT is rated at 95 M.G.D. capacity. The base load is carried by three 15 M.G.D. motor-driven centrifugal pumps. Seen here are two 24 x 18 in. pumps operating in series against 270 ft head and driven by 900 hp synchronous motor — all Allis-Chalmers!



EAST SIDE STATION has capacity of 22 M.G.D. — exclusively in Allis-Chalmers pumps! The three pumps seen at center supply 3475 gpm against 90 ft head, driven at 1760 rpm by 100 hp induction motors — all Allis-Chalmers. Gas engine in rear drives an A-C 4865 gpm pump.

EXTERIOR VIEW of Main pumping plant near downtown Fort Worth. The waterworks pumped well over 10 *billion* gallons in 1950 with a peak day of 53 million gallons more than *double* that of 1940's peak day. The maximum recorded hourly pumping rate was 79.2 M.G.D.

NORTH SIDE STATION, like East Side (above) and West Side (not shown) uses Allis-Chalmers pumps exclusively. Pumps and 100 hp induction motor drives — both Allis-Chalmers — seen above furnish 3 M.G.D. each at 125 ft head. An Allis-Chalmers 4½ M.G.D. pump here is not shown.

to Bombers!

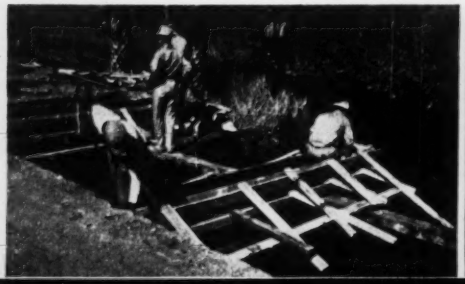
EVERYTHING FROM MEAT PRODUCTS TO B-36's

ALLIS-CHALMERS

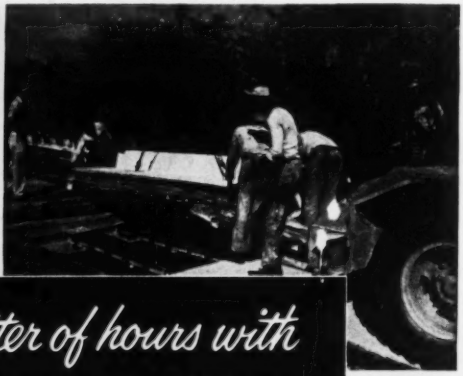
A-C ALLIS-CHALMERS

Builders of the World's Widest Range of Public Works Equipment

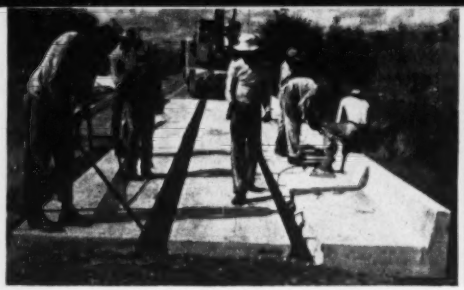
After removing timber deck and stringers, forms are set for the risers.



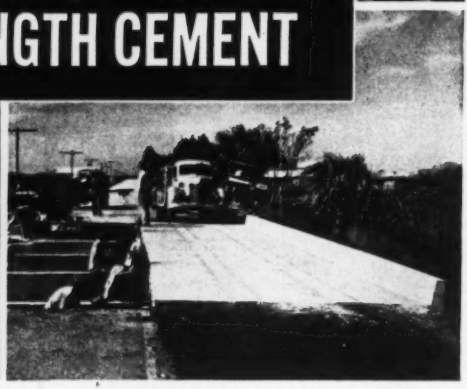
Placing concrete deck slabs.



Bridges rebuilt in a matter of hours with
LEHIGH EARLY STRENGTH CEMENT



Reinforcing bars projecting from slabs are joined with cable clamps. Forms are drawn up and wired under the open strips ready for pouring.



Traffic moving over completed half of a 5-span bridge.

Along the Tamiami Trail, Florida engineers are setting new records in rebuilding old timber bridges with fireproof and rotproof concrete. They are replacing worn-out decks in as little as 34 hours, at costs less than for timber construction.

With their unique design and construction methods . . . and Lehigh Early Strength Cement . . . a 2-span, 30-foot bridge, for instance, is rebuilt in 4 working days; a 5-span bridge in 9 days.

Deck slabs are precast in the district maintenance yard. Forms are stripped the following day. Slabs are immediately moved to storage, or in emergencies, to bridge site. And here's the schedule for replacing a typical 2-span bridge.

FIRST DAY. The crew barricades one half of roadway, rips off one half of deck and stringers, sets forms and pours concrete risers on existing piers. Other half of roadway is open to traffic.

SECOND DAY. The crew places slabs ten inches apart on piers. Forms are drawn up and concrete poured in the open strips by 2 P.M. and approaches completed.

THIRD DAY. The finished half of bridge is ready for traffic. Construction of other half follows same method. By end of fourth day, the entire bridge is completed.

Engineer of Bridges:
W. E. DEAN

District Engineer:
J. M. WATSON

Ass't District Engineer:
WINSTON CARLTON

Maintenance Engineer:
KIRBY S. STORTER

Superintendent—Maintenance Forces:
W. B. McKAY

Lehigh
CEMENTS

LEHIGH PORTLAND CEMENT COMPANY
ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

LEHIGH PORTLAND CEMENT · LEHIGH EARLY STRENGTH CEMENT · LEHIGH AIR-ENTRAINING CEMENT · LEHIGH MORTAR CEMENT

Swing bridge, N. Car.

Continued from preceding page

and casting bent caps and approach spans, constructing fenders, furnishing and erecting steel truss swing span and installing operating machinery and electrical equipment. Tar waterproofing of concrete piles is specified to protect them from sea water. Completion date is set at May 1, 1953, with 400 working days allowed for the job. The job is half a mile from the railroad.

Wage rates prevailing in the area are $0.95 for skilled labor, $0.85 for semi-skilled and $0.75 for common labor.

Lump sum bids were taken on the structural steel. At the approximate weight given as 515,000 lb the contract price works out at around 24.3 cents per lb.

Bidders were:

1C T. A. Loving & Co., Goldsboro N. C.	$1,377,672
2 Wannamaker-Wells, Inc., Orangeburg, S. C.	1,399,984

Bids: 5-8-51 Items	Unit	Quantity	Unit prices 1 C	2	
Rem exist struct	ls			$55,000	$50,000
Cl A conc	cy	5,723	66 00	66 50	
Reinf steel	lb	2,371,170	0 12	0 13	
Str. steel, 515,000 lb	ls			125,000	130,000
Creos str timber	Mfbm	110 3	375 00	450 00	
Creo timber piles	lf	18,630	2 50	3 00	
20" prec conc piles	lf	27,591	7 50	7 00	
18"	lf	1,920	5 00	6 90	
Prec conc sheet piles	lf	7,080	6 50	5 90	
Meth D damp proofing	sf	9,000	1 75	0 50	
Machy 47,000 lb	ls			72,000	70,000
Elect equip	ls			65,000	60,000
3" stl grid fl with conc	sf	6,492	3 30	4 50	
2"	sf	1,375	2 00	3 75	
Operator's house	ls			4,000	4,800
Bridge tender's house	ls			4,000	3,800

Pontoon bridge, Louisiana

Grading, timber bridges, shell surfacing, a welded steel pontoon barge, 84'x24'x7' and a power unit drew a low bid of $80,951 on July 11, 1951. This pontoon bridge over Bayou, Lafourche at Cote Blanche in Lafourche Parish, La. is being built for the Louisiana State Department of Highways, E. E. Guillot, Thibodaux, La., project engineer.

Wage rates on the job are $1.90 for skilled, $1.20 for semi-skilled and $0.90 per hour for common labor.

The two bidders were:

1C W. R. Fairchild Constr. Co., Hattiesburg, Miss.	$80,951
2 Austin Bridge Co., Dallas, Tex.	84,775

Bids: 7-11-51 Items	Unit	Quantity	Unit prices 1C	2	
Common exc	cy	30	$2 00	$1 50	
Drain exc	cy	558	2 00	1 50	
Spec borrow exc	cy	35	2 00	2 00	
Mulch sodding	cy	31	2 50	3 00	
Shell surf crse	cy	72	8 00	7 00	
Fabr carbon steel	lb	30,830	0 25	0 25	
Creo SYP timber	Mfbm	45 926	310 00	345 00	
Creo Doug fir timb	Mfbm	45 926	310 00		
Tr timber (TWS)	Mfbm	1 325	310 00		
Tr timber (ZM-A)	Mfbm	1 325	310 00	350 00	
Tr timber (CZC)	Mfbm	1 325	310 00		
Fort Brdcst (comm fert) (6-10-14)	lb	100	0 10	0 10	
Creo timber piles	lf	7,665	2 30	2 50	
Unload timb test piles	ea	1	1,100 00	1,000 00	
Loading test piles	ea	1	100 00	200 00	
RoW markers, conc posts	ea	4	7 00	10 00	
Welded st pontoon barge 84'x24'x7'	ls		26,500 00	26,875 00	
Power unit	ls		7,400 00	7,600 00	
Operating house	ls		1,250 00	1,500 00	
12"x12"x12' conc balancing blocks	ea	192	2 25	3 00	
1/4" check stl traf plates	sf	1,182 5	1 90	1 90	

Gravel surface and timber bridge, Montana

A federal-aid secondary project in Madison County, Mont. drew 8 bidders June 13, 1951 for 5.005 mi of grading, gravel surfacing, road-mix oiling, small drainage structures and a 38-ft treated timber pile bridge. The State Highway Commission of Montana awarded the contract to the low bidder at $151,000, with work to be completed by July 31, 1952.

Wage minimums specified by the state range from $1.30 for skilled labor through $0.925-1.05 for intermediate skills to $0.75 for common labor.

Bidders include:

1C Naranche & Kondo, Butte, Mont.	$151,000
2 Peter Kiewit Sons Co., Sheridan, Wyo.	153,884
8 McLaughlin, Inc., Great Falls, Mont.	184,990

Bids: 6-13-51 Items	Unit	Quantity	Unit prices 1 C	2	
Unci exc & borrow	cy	123,060	$0 42	$0 44	
Culvert excavation	cy	257	2 00	2 50	
Overhaul	sta yd	122,280	0 01	0 45	
Cr grav cover mat'l	ton	1,325	2 50	3 50	
Type "A" top Co. 3/4" grd	ton	17,140	1 05	1 11	
Base co surf, grd C-2	ton	31,781	0 85	0 86	
Ap. MC-3 ARO for mix	gal	93,891	0 15	0 13	
Ap. RS-2 em asph seal	gal	26,497	0 17	0 14	
Ap. MC-1 ARO for pr	gal	16,087	0 15	0 14	
Processing	sy	486	0 60	0 70	
Processing	mi	5 005	900 00	1,000 00	
Rolling surf courses	ea	310	8 00	7 00	
Rolling embankment	ea	120	8 00	7 00	
Watering	M gal	2,660	1 50	0 75	
15" CMP culverts	lf	128	3 00	3 50	
18"	lf	32	4 00	4 50	
24"	lf	644	6 00	6 50	
36"	lf	24	10 00	11 00	
72"	lf	82	30 00	35 00	
Relay pipe culverts	lf	28	3 00	2 00	
Wood guide posts	ea	17	10 00	10 00	
Hand-laid riprap	cy	40	10 00	25 00	
Conc proj markers	ea	2	25 00	25 00	
Conc R/W monuments	ea	45	5 00	10 00	
Rem ex str sta. 470+60	ls	All	150 00	150 00	
Treated timber	Mfbm	15 88	350 00	350 00	
Untreated timber	Mfbm	0 85	300 00	350 00	
20' tr timb piles	ea	21	75 00	75 00	
Structural steel	lb	420	0 30	0 30	
Type "A" stkp'd gr., 3/4"	ton	400	1 00	1 11	

Grading and structures for blacktop highway, N. M.

Brown Contracting Co. of Albuquerque, New Mexico, with a bid 15% below the estimated cost, was awarded the contract for the 6.484 mile U.S. Highway Route No. 85 by the New Mexico State Highway Commission on June 19, 1951. B. G. Dwyre is state highway engineer. The low bid of $451,170.40 was 2% below the next to low bid and 7% below the high.

The highway will extend between the towns of Raton and Hoxie Junction. Some difficulty with cold weather may be encountered because of the high altitude which is approximately 6,660 feet. Work will start on July 23, 1951 and must be completed on July 15, 1952; contractor will furnish all material.

Minimum wage rates are: unskilled labor, $1.15-$1.50; equipment operators, $1.90 to $2.25; reinforcing iron workers, $2.00; truck drivers, $1.15-$1.675.

Bidders include:

1C Brown Contracting Co., Albuquerque, N. M.	$451,170
2 Skousen-Hise Contracting Co., Albuquerque, N. M.	462,450
8 W. T. Bookout Construction Co., Las Vegas, N. M.	487,457

Bids: 6-19-51 Items	Unit	Quantity	Unit prices 1 C	2	
Rem old structs	ls			$8,000	$10,000
Exc uncl	cy	258,200	0 18	0 27	
Exc for structs	cy	1,780	2 00	2 00	
Exc for pipe culvs	cy	260	2 00	2 00	
Overhaul	sta y	547,930	0 01	0 02	
Haul	May	178,195	0 05	0 06	
Ton mile haul	tmi	636,580	0 06	0 065	
Mech tamping	hr	774	4 50	5 00	
Sheepsft rol	hr	2,310	4 00	4 50	
St tired rol	hr	544	6 00	6 00	
Pneum tired rol	hr	1,931	4 00	3 50	
Ballast	ton	77,045	0 58	0 50	
Leveling crse	ton	26,950	0 62	0 70	
Watering	M gal	15,575	0 50	0 50	
Cl AE-AR conc	cy	2,155	49 00	47 00	
Waterproofing	sy	625	1 00	1 00	
Reinf steel	lb	288,410	0 13	0 11	
Std RC pipe, 24" dia	lf	472	7 50	7 25	
30"	lf	332	10 00	9 50	
36"	lf	72	13 00	13 00	
48"	lf	88	21 00	20 00	
Cattle guard, 18' rdwy	ea	1	1,500	1,500	
24' rdwy	ea	1	1,800	2,400	
Monuments and markers	ea	2	50 00	75 00	
Galv barbed wire	lf	56,075	0 13	0 15	
Bracing	ea	141	5 00	6 00	
Gates-std	ea	9	30 00	60 00	
Tr tim wrn pats refl 6" dia	ea	81	6 00	6 00	
ROW markers	ea	83	6 00	6 00	
Obslt old road	mi	4 7	400 00	400 00	
Contour ditches	lf	13,800	0 10	0 10	
Rock & wire check dams	cy	82	15 00	20 00	
Cutbk asph-type MC-1	bbl	632	6 25	6 90	
Type RC-2	bbl	221	6 25	7 50	
Type RC-4	bbl	632	7 00	7 90	
Agg-seal coat	ton	1,005	4 00	5 00	
Hot plant asph pave	ton	10,095	4 27	2 75	
85-100 asph for hot pl asph pave	bbl	3,300	6.00	5.90	

Bascule bridge, Wis.

Lump sum bids were taken Aug. 15, 1951 by Milwaukee, Wis., Lloyd D. Knapp, city engineer, on a $1,108,547 steel bascule bridge at Juneau Ave.

The principal dimensions are: 48-ft roadway, two 6.5-ft sidewalks, 90-ft steel span, clear waterway, 115 ft c to c of trunions, 80-ft clearance between fender piles, two 27-ft long by 48-ft wide concrete pavement approaches.

Superstructure quantities include 438 tons of structural steel, 90 tons of operating machinery, 5040 sf of roadway grating.

Substructure includes two reinforced concrete piers and these estimated quantities: 6,000 cy of concrete, 6,000 cy of excavation, 70 tons of reinforcing steel, and 940 tons of sheet and bearing piles.

Bidders include:

Substructure

1C Great Lakes Dredge & Dock Co., Milwaukee, Wis.	$579,300
2 Edw. E. Gillen Co., Milwaukee, Wis.	616,110
4 H. H. Mass Constr. Co., Algonquin, Ill.	683,000

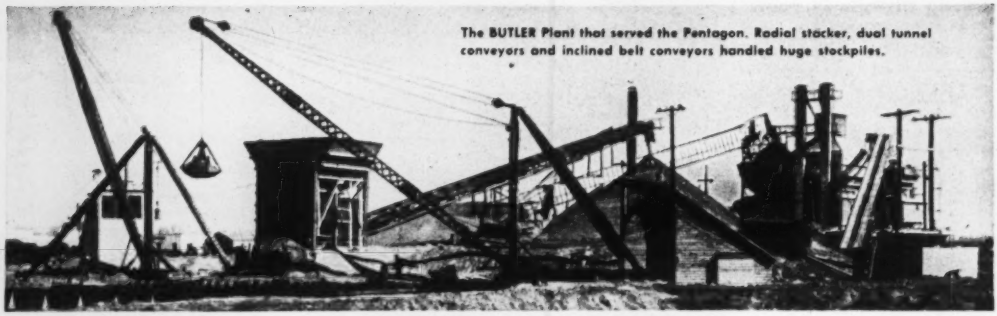
Superstructure

1C J. C. Thallacker Co., Milwaukee, Wis.	$529,247
2 Milwaukee Bridge Co., Milwaukee, Wis.	531,638

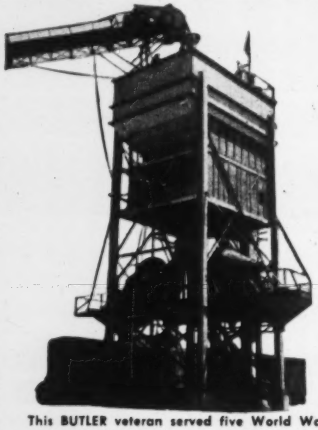
These contract prices average:

per sf of roadway, c to c of trunions		per sf of roadway, including approaches:	
substructure	$104 95	substructure	$71 41
superstructure	95 88	superstructure	65 24
total	$200 83	total	$136 65

Work is to start Dec. 1, 1951 and be completed within 540 days. The job is an eighth of a mile from the railroad. Wages average $2.64 for skilled workers, $2.30 for semi-skilled and $1.96 for common labor.



The BUTLER Plant that served the Pentagon. Radial stacker, dual tunnel conveyors and inclined belt conveyors handled huge stockpiles.



This BUTLER veteran served five World War II projects in five widely separate States: Hoosier Ordnance Plant, Lone Star Ordnance Plant, Navy Supply Base, Hanford Engineering Works (Atomic Bomb Plant) and Government Ordnance Plant. In the peacetime years it built a power dam and now, re-designed and improved, is pouring for the Hydrogen Bomb Plant.

A BUTLER Bulletin offered FREE on request has a comprehensive showing of Central Mixing and Ready Mixed Plants in a wide variety of capacities. Ask for Bulletin 260.

BUTLER SERVES *the Atomic Age* in its giant construction projects

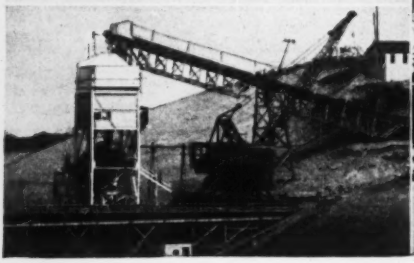
If you will be constructing a gigantic building, a power dam, a modern airfield, an atomic plant — any project that demands an enormous volume of concrete poured in record-breaking time — it will pay you well to have BUTLER engineer and build your Central or Ready Mixed Concrete Plant.

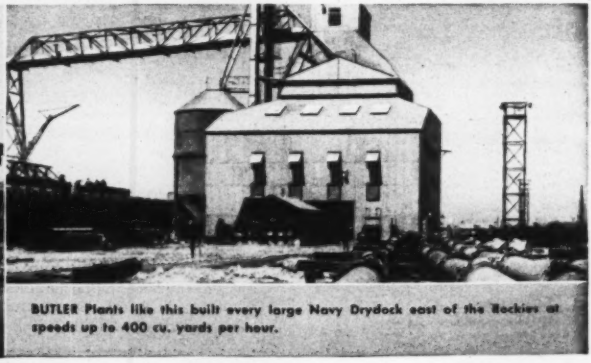
The Butler Plants shown here are a few of many that served in heavy construction such as the Hanford Atomic Bomb project, the Pentagon and large Navy drydocks. They represent top-level production in World War II. Today, new engineering ideas, new methods, new automatic controls, bring you even *higher* production standards in the BUTLER Plants that serve the Atomic Age.

Remember, concrete is as important as armament.

BUTLER BIN CO.
947 BLACKSTONE AVE.
WAUKESHA, WIS.

A BUTLER Central Mixing Plant, equipped with front charging mixers and automatic controls, poured the concrete for the Denison Dam.





BUTLER Plants like this built every large Navy Drydock east of the Rockies at speeds up to 400 cu. yards per hour.

Will Rogers Airport, Okla.

Six bidders ranged from $404,751 to $440,441 for runway extensions to Will Rogers Municipal Airport at Oklahoma City. Bids were opened June 19, work had to start within 30 days and be completed in 150. It includes light grading, asphaltic concrete runways and drainage. Toler, Jones & Toler of Oklahoma City are the consulting engineers.

Wage scales are $2.25 for skilled labor, $2 for semi-skilled and $1.25 for common labor.

Alternate bids were taken on surfacing quantities which show in the unit price report which follows.

Bidders include:

1C Steelman Construction Co., Oklahoma City	$404,751
2 Amis Constr. Co., Oklahoma City	414,868
8 Holloway Constr. Co., Albuquerque, N. M.	440,441

Bids 6-19-51 Items	Unit	Quantities	Unit prices 1 C	2
Uncl exc	cy	60,000	$0.30	$0.34
6" Compacted subgr	sy	59,199	0.10	0.03
8" Subbase	sy	57,039		0.64
10" Conc pave	sy	26,666.67		5.00
12" Conc pave	sy	29,155.67		6.00
Cl "A" conc	cy	25.88	45.00	45.00
Reinf steel	lb	2,382	0.11	0.15
St sewer gr & fr, type B	ea	4	90.00	60.00
type B reversed	ea	4	90.00	60.00
type D	ea	12	90.00	60.00
18" R C Pipe	lf	800	4.13	4.00
24"	lf	440	4.95	5.50
30"	lf	880	8.50	7.00
36"	lf	440	10.50	10.00
42"	lf	512	14.50	12.00
Bermuda tuft sodding	sy	232,320	0.05	0.04
Bermuda slab sodding	sy	145.5	1.00	1.00
Water for sodding	M gal	232.5	2.00	1.50
Comm'l fertilizer	lb	20,909	0.055	0.07
6" Stab agg base crse	sy	2,250	0.65	1.30
Prime material, see alt a	gal	740	0.12	0.35
6" Asph concr, see alt b	sy	2,210	2.84	3.70
Seal coat, see alt c	gal	423	0.14	0.35
Cover aggregate see alt d	ton	19	4.56	6.00
Alternate quantities				
Prime material a	gal	20,704	0.12	
9" Asph concrete b	sy	56,574	4.26	
12" Stabd agg base crse	sy	27,022	1.30	
15" Stabd agg base crse	sy	30,017	1.62	
Seal coat c	gal	11,588	0.14	
Cover aggregate d	ton	522	4.56	

Concrete runway, Minn.

Minneapolis-St. Paul Metropolitan Airports Comm. received 8 bids on June 29 for resurfacing Wold Chamberlain Field. Contract went to the low bidder, S. J. Groves & Sons Co., Minneapolis. Toltz, King & Day, St. Paul, are the consulting engineers.

Minimum wage rates to be paid range from $1.90 to $2.45 for skilled labor, from $1.77 to $2.12 for semi-skilled and from $1.65 to $1.67 for common labor.

Bidders include:

1C S. J. Groves & Sons Co., Minneapolis	$415,360
2 Anderson & Sons, Inc., Minneapolis	441,907
8 Fielding & Shepley, St. Paul	484,426

Bids 6-29-51 Items	Unit	Quantity	Unit prices 1 C	2
Rem conc pave	sy	53,020	$0.95	$1.10
M H & C B	ea	21	50.00	90.00
Com exc	cy	29,700	0.74	0.71
Water	M gal	200	3.50	3.00
St MH & CB Fr & cov in pl Type "K"	assm	14	250.00	350.00
Type "E" MH 0-8' depth	ea	14	475.00	875.00
Rock exc	cy	5	15.00	9.20
Granular backfill	cy	10	6.00	5.40
11" conc pave	sy	57,800	5.20	5.30
Asph concr	ton	75	25.00	24.00
Asph cement	ton	8	40.00	37.00
Bit mat'ls for Pr & sl coats	gal	450	0.30	0.25
Fertilizing	ac	10	30.00	25.00
Seeds	lb	800	0.75	0.72
Seeding	ac	10	15.00	12.00
Cover crop incl seed	ac	10	20.00	14.00
4-way duct bank	lf	571	9.00	10.50
6-way duct bank	lf	504	11.00	12.50
8-way duct bank	lf	650	12.00	14.50
12-way duct bank	lf	190	15.00	16.70
Duct markers	ea	9	15.00	20.00
Type "A" elec MH	ea	3	1,600.00	2,400.00
Elec MH st fr & cov	assb	3	200.00	290.00
Split tile encamnt	open	2	25.00	27.00

Resurface and extend runway, Adams Field, Ark.

Resurfacing 4,000 ft of existing NW/SE runway at Adams Field, Little Rock, Ark. and extending runway an additional 1,820 ft, plus a taxi strip drew 5 and 6 bidders respectively, June 4, 1951, but both jobs went to the same contractor, low bidder on each. The owner is Departments of the Army and the Air Force, National Guard Bureau, Little Rock and L. A. Henry, Little Rock, was the consulting engineer.

Resurfacing of existing concrete is with 1½" asphaltic concrete. New work is asphalt on 12" macadam base.

Minimum wage rates start at $0.875 for laborers, $0.95 for asphalt workers except burnermen who start at $1.00; $2.00 for cement finishers, $1.875 for power equipment operators, asphalt spreaders, graders, bulldozers, $2.375 for shovel operators, $1.25 for 1½-cy truck drivers, $1.55 over 5 cy.

Bidders include: Bids 6-4-51

Resurface present runway

1C Ben M. Hogan, Little Rock, Ark.	$118,014
2 Reynolds & Williams, L. R., Ark. & Shreveport, La.	130,537
5 J. B. Michael, Memphis, Tenn.	148,153

Items	Unit	Quantity	Unit prices 1 C	2
Schedule "A"				
Bit binder course	ton	515	$6.00	$7.35
Asph in binder course	ton	31	25.00	24.00
Bit surface course	ton	6,872	6.50	7.35
Asph in surface course	ton	412	25.00	24.00
Tack coat (RC-2)	gal	6,872	0.15	0.16
Seal coat (AC-100-120)	gal	17,180	0.15	0.16
Cover aggregate	ton	412	6.50	5.00
Inst Cl "E" fence	lf	3,240	1.00	1.75
Const Cl "D" fence	lf	3,000	1.50	2.40
Schedule "B"				
Bit binder course	ton	650	6.00	7.35
Asph in binder course	ton	39	25.00	24.00
Bit surface course	ton	4,044	6.50	7.35
Asph in surf course	ton	243	25.00	24.00
Tack coat (RC-2)	gal	6,470	0.15	0.16
Seal coat (AC-100-120)	gal	16,175	0.15	0.16
Cover aggregate	ton	388	6.50	5.00

Extension of NE/SW runway

1C Ben M. Hogan, Little Rock, Ark.	ext runway	$343,814
	taxi strip	29,823
2 Reynolds & Williams, L. R., Ark. & Shreveport, La.	ext runway	380,777
	taxi strip	34,427
6 Artie Gregory, Little Rock, Ark.	ext runway	398,370
	taxi strip	34,773

Items	Unit	Quantity	Unit prices 1 C	2
Clear and grub	ac	13	$300.00	$350.00
Uncl exc	cy	175,000	0.52	0.42
Cr rock-aggr. base crse	cy	24,370	3.80	5.23
Bit surf course	ton	8,884	6.50	7.20
Bit mat'l in surf crse	ton	533	25.00	24.00
Bit prime coat (RC-2)	gal	23,697	0.15	0.16
Bit seal coat (AC)	gal	19,748	0.15	0.16
Cover aggregate	ton	592	6.50	5.00
15" RC drain pipe	lf	660	3.00	3.75
18" RC drain pipe	lf	550	4.00	4.40
21" RC drain pipe	lf	500	5.00	5.10
24" RC drain pipe	lf	2,210	6.00	5.75
30" RC drain pipe	lf	3,050	7.50	7.40
36" RC drain pipe	lf	400	10.00	9.00
Catch Basins compl	ea	23	600.00	250.00
Struct P cement conc	cy	8	50.00	90.00
Seeding	ac	120	30.00	30.00
Road location grading	sta	29.2	30.00	32.50
2" Cr rock base—road	cy	1,081	3.80	5.23
2" Bit surface—road	ton	649	6.50	7.20
Bit mat'l in road surf	ton	39	25.00	24.00
Taxi strip				
Uncl exc	cy	10,000	0.52	0.42
Cr rock aggr base course	cy	3,400	3.80	5.23
Bit surf course	ton	1,250	6.50	7.20
Bit mat'l in surf crse	ton	75	25.00	24.00
Bit prime coat (RC-2)	gal	3,000	0.15	0.16
Bit seal coat (AC)	gal	2,500	0.15	0.16
Cover aggregate	ton	75	6.50	5.00
Seeding	ac	13	30.00	30.00

Tunnel, Buford Dam, Ga.

Contract for initial excavation and tunnel for Buford Dam went to the low bidder at $2,822,788 for forebay, tunnels, tailrace, saddle dikes 1 & 2 and access road. Seven contractors submitted bids on May 22, 1951 to District Engineer, Corps of Engineers, Mobile, Ala. Resident engineer is C. A. Jackson, Buford, Ga.

The entire project, which will cost $40 million, is on the Chattahoochee River, 35 mi northeast of Atlanta, Ga. Work on this initial contract started May 25 and must be completed by Oct. 18, 1952. The site is 4 mi from the railroad. One steel bridge is to be dismantled at one location and moved to another.

Minimum wage rates start at $1.00 for laborers and go up to $3.00 for painters of structural steel erected. Structural ironworkers get $2.25, reinforcing steel, $2.00, carpenters $2.00, bulldozer operators, $1.50 under 40 hp, $1.75 over 40 hp, scrapers including Tournapulls, $1.75; shovels, $2.25, compressors, $1.50, powdermen, $1.50, air tool operators (jackhammers, vibrators) $1.10.

Bidders include:

1C Groves, Lundin & Cox, Inc., Minneapolis, Minn.	$2,822,788
2 Codell Constr. Co., Inc., Winchester, Ky.	2,844,405
7 Ralph Myers Contracting Corp., Salem, Ind.	3,757,303

Bids: 5-22-51 Items	Unit	Quantity	Unit prices 1 C	2
Forebay, tunnels, tailrace & saddle dikes nos. 1 & 2	ls	1	$25,000.00	$30,000.00
Cofferdam protect'n	ls	1	25,000.00	36,500.00
Sprigging & overseeding, saddle dikes	ac	7	500.00	250.00
Clearing & grubbing	ls	1	25,000.00	36,500.00
Stripping	cy	23,900	0.50	0.40
Excavation, uncl	cy	685,151	1.10	0.91
Excavation, rock	cy	894,203	1.35	1.60
Excavation, tunnel	cy	15,515	24.00	18.50
Line drilling	af	84,282	1.50	1.50
Compacted earth fill	cy	389,746	0.10	0.10
Add'l rolling for comp oper	hr	50	20.00	25.00
Filter material	cy	2,276	7.50	5.00
Dumped riprap	cy	5,735	3.00	4.00
Topsoil planting	ac	4.5	2,500.00	300.00
Access road				
Clearing & grubbing	ls	1	10,000.00	3,500.00
Uncl rdwy exc & borrow	cy	96,400	0.75	0.67
Agg base course	sy	25,200	1.50	1.75
Bituminous prime coat	gal	8,450	0.30	0.22
Single bit surf tr	sy	23,200	0.50	0.26
18" culvert pipe	lf	492	5.00	5.75
21" culvert pipe	lf	80	7.50	6.75
24" culvert pipe	lf	84	10.00	8.00
36" culvert pipe	lf	219	15.00	14.00
Reinf conc for hdwls & inlets	cy	30	50.00	75.00
Pl conc for headwalls	cy	1	50.00	75.00
4" paved gutters	sy	65	4.00	6.00
Remov exist timber culv	ls	1	100.00	100.00
Guard rail	lf	5,179	3.00	3.50
Sprigging & overseeding, access road	ac	14.8	500.00	250.00
Sod ditch checks	sy	250	2.00	2.00
Constr of bridge	ls	1	50,000.00	75,000.00
21" CM culvert pipe	lf	84	7.50	6.50
Acceptance			30 da	10 da

PENNSYLVANIA TURNPIKE EXTENSION

Topographic survey for 140-mile highway. Ground methods estimate: $415,000 and 2½ years. AERO delivered completed maps 145 days after start for $83,000.

Saving—$332,000 and 769 days.

BEAR MOUNTAIN HIGHWAY LINK

Topographic survey for 31-mile New York highway. Ground methods estimate: $74,400 and 2 years. AERO delivered maps in 90 days, for $17,500.

Saving—$56,800 and 640 days.

210,000-ACRE AEC FACILITY

Topographic survey for huge new Atomic Energy facility in S. Carolina. Maps for 210,000 acres were delivered 160 days after start.

Saving—years faster than ground surveys.

CITY MAPPING FOR DURHAM, N.C.

Topographic survey of 31-sq. mile city area. AERO mapped in 7 months for $30,000. Ground methods estimate: costs $180,000 and over 5 years.

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Gaviota Gorge Tunnel, California

The Rhodes-Shofner Construction Co., Inc. low bid of $464,929 took the contract for a concrete lined tunnel at Gaviota Gorge, 1¼ miles south of Las Cruces in Santa Barbara County, Calif. The only other bid received June 6, 1951 by the State Division of Highways, Sacramento, was for $798,429 from Macco Corp. of Paramount, Calif.

Work, which also includes grading a tenth of a mile of roadway and paving with portland cement concrete, started July 1 to be completed in 200 working days. All materials are furnished by the contractor. The job is two miles from a railroad.

Wages range from $1.70 per hour for common labor to $2.40 for concrete mixer operators. Powdermen get $2.10, muckers $1.90, drillers $2.03, carpenters $2.35, reinforcing ironworkers $2.38.

Bidders:

1C Rhoades-Shofner Const. Co., Inc., Los Angeles, Calif.	$464,929C
2 Macco Corp., Paramount, Calif.	798,429

Bids 6-6-51 Items		Quantity	Unit prices 1 C	2
Remove coner	cy	16	$8.00	$12.00
Clear & grub	sta	20	100	400
Roadway exc	cy	20,000	2 50	3 00
Exc struct	cy	1,900	5 00	6 00
Exc tunnel	cy	12,500	7 80	26 60
Backfill, selec	cy	1,070	3 50	4 00
Overhaul	sta y	90,000	005	0 03
Imperv base mat'l	cy	5	6 00	4 00
Perv base mat'l	cy	216	8 50	8 00
Prep subgrade	sy	1,290	0 10	0 20
Dev water supply	ls		6,500	15,000
Apply water	M gal	1,500	1 50	3 00
PCC pavement	cy	382	25 00	25 00
Pave tiebolt assem	ea	202	0 80	1 00
A conc, structs	cy	1,400	65 00	100
A conc, tunnel lining	cy	1,636	65 00	100
Waterstops	lf	54	3 00	2 00
Tunnel weepers	ea	28	25 00	40 00
Grout pipes	ea	120	5 00	8 00
2" std. pipe	lf	86	1 50	3 00
PCC gutters	cy	8	35 00	50 00
R/W monuments	ea	13	10 00	8 00
New prop fence	mi	0 4	1,200	3,000
Drive gates	ea	2	60 00	100
CM Pipe 8" 16 ga	lf	200	1 90	7 50
12" 16 ga	lf	82	3 00	5 00
18" 16 ga	lf	120	4 20	4 00
24" 14 ga	lf	210	6 20	5 00
48" 12 ga	lf	194	18 00	19 37
Perf met pipe 8"	lf	194	2 00	5 00
12"	lf	4	3 00	3 00
48"	lf	40	4 40	4 00
Filter mat'l	cy	25	10 00	10 00
18" CMP 45° ell	ea	1	25 00	20 00
VC pipe 4"	lf	114	2 00	1 50
Reinf steel	lb	170,000	0 16	0 14
Gr anch bars, ¾"	ea	50	6 00	10 00
CI soil pipe, 8"	lf	100	12 00	8 00
12"	lf	20	17 00	12 00
CM tree wells	ea	4	200	150
Lighting equip	ls		5,000	6,000

Curtain grouting, Florida

Drilling and grouting for lock and fixed crest spillway, Jim Woodruff Dam, Apalachicola River, Fla., drew four bids June 12, 1951 for the Mobile District, Corps of Engineers, Mobile, Ala. Walter C. Knox is resident engineer, Chattahoochee, Fla.

Grout curtain is to be pumped into foundation of dam 1634 ft long and of lock 450 ft by 82 ft. Work started June 27 and is to be completed by February 22, 1952. Grouting is very similar to that for cofferdam, see ENR 7-6-50, except that it will extend deeper and will be pumped under higher pressure. Job is 1 mi from a railroad.

Minimum wage rates range from $0.85 for laborers, $1.25 to $2.00 for truck drivers, $2.00 for air compressor operators, $2.40 for mechanics, $1.75 for carpenters.

Bidders include:

1C Intrusion Prepakt, Inc., Cleveland, Ohio	$524,471
2 Cannon Diamond Drilling Co., Ltd., Compton, Calif.	539,934
4 Cunningham Core Drilling & Grouting Co., Salem, Va.	756,760

Bids: 6-12-51 Items	Unit	Quantity	Unit prices 1 C	2
Lock				
Drill'g 1 3/8" gr holes	lf	16,050	$2.25	$1.00
Portland cement	sack	48,150	1.70	1.80
Sand	cf	104,325	0.40	0.55
Flyash	sack	16,050	1.27	0.90
Fluidifier	lb	57,300	0.18	0.30
Drill'g 1 3/8" uplift indication holes	lf	100	2.25	2.00
Pump'g from lock area	M gal	225,000	0.05	0.03
Fixed crest spillway				
Drill'g 1 3/8" gr holes	lf	16,400	2.25	1.00
Portland cement	sack	88,560	1.70	1.80
Sand	cf	191,880	0.40	0.55
Flyash	sack	29,520	1.27	0.90
Fluidifier	lb	105,400	0.18	0.30
Drill'g 1 3/8" upl ind hls	lf	860	2.25	2.00

Revetment and dredging, La.

The low bid of $147,919 took the contract for 2,300 lf of board revetment on the Red River, Red River Parish, La. Bids were opened June 13, 1951 by District Engineer, Corps of Engineers, New Orleans District.

Work started within 15 days of notice to proceed and was to be completed in 120 calendar days. Liquidated damages are $50 for each calendar day of delay.

Bidders were:

1C Mississippi Valley Engr. & Constr. Co., Memphis, Tenn.	$147,919
2 Hough-Cowgur & Co., Inc., St. Louis, Mo.	149,945
3 Kansas City Bridge Co., Kansas City, Mo.	224,311

Bids 6-13-51 Items	Unit	Quantity	Unit prices 1 C	2
Grading	cy	32,000	$0.32	$0.30
Lumber Mattress	sq	2,770	21.50	21.00
Stone on Mattress	ton	5,630	6.60	7.00
on upper bnk pav	ton	5,700	6.25	6.60
Gravel	ton	980	5.45	5.25

Furnishing all plant, labor, materials, and equipment and performing all work on 2,100,000 cy of channel excavation on the Mermentau River, Louisiana drew five bids. The District Engineer, New Orleans District awarded the work to the low bidder at $256,830. Bids included:

1C F. J. J. Sloat Dredging Co., Slidell, La.	$0.1223
2 Great Lakes Dredge & Dock Co., New Orleans.	0.1293
5 Atlantic, Gulf & Pacific Co., New York	0.1796

Minimum wage rates are the same for both jobs: unskilled labor $0.75, skilled labor, $1.75 to $2.25. On revetment work laborers, hookers, twisters, weavers get $0.80 minimum, winchmen $1.05.

UNIT PRICES published during this year will total 39 pages. For a complete index of 1951 unit prices, write Manager, Business News Department, Engineering News-Record, 330 West 42 St., New York 36, N. Y.

Channelization, N. Mex.

Contract for excavation of 21 miles of the channel from San Marcial to the narrows of Elephant Butte Reservoir, Middle Rio Grande Project, New Mexico was awarded to the lowest bidder at $897,960.50. Seven contractors submitted bids on August 30, 1951 to the Bureau of Reclamation, El Paso, Texas.

The project entails clearing of the floodway and the areas to be occupied by the levee, berm, channel, and dike west of the channel; construction of the levee and dikes and construction of a 72-inch diameter corrugated-metal pipe culvert and 4 timber bridges. All materials are to be furnished by the contractor and work is to be completed in 465 days.

Bidders include:

1C Morrison-Knudsen Co., Inc., Los Angeles	$897,960.50
2 McGinnes Bros. Inc., Houston, Texas	940,118.00
7 J. H.-M. N. Monaghan & Assoc. Cos. & Colo. Constructors, Inc., Derby, Colo.	1,987,055.00

Bids: 8-30-51 Items	Unit	Quantity	Unit prices 1 C	2
Clearing	ac	3,200	$40.00	$87.00
Exc for channel	cy	2,800,000	0.20	0.16
Exc for cut-off tr	cy	77,500	0.20	0.15
Exc from borrow	cy	794,000	0.20	0.19
Exc for structures	cy	1,700	1.90	1.00
Backfill	cy	390	1.25	2.00
Compacting backfill	cy	390	2.50	3.00
Riprap	cy	5,000	3.00	6.00
Grav bed under riprap	cy	2,500	3.50	4.00
F&I 72" CM pipe	lf	186	33.00	30.00
F&e tr timb in struct	Mfbm	8	460.00	400.00
F&e untr timb in struct	Mfbm	60	335.00	350.00
F&dr tr timber piles	lf	2,000	4.65	2.50
Exc for pilot channel	cy	32,000	0.25	0.15

* f&i furnish & lay * f&e furnish & erect
* f&dr furnish & drive

Snow fence and beach protection, New York

Two jobs in Suffolk County, New York illustrate today's costs for beach protection. Bids received September 12, 1951 by the Public Works Department, State of New York are for hydraulic fill and beach grass planting and for bulldozing and furnishing and installing snow fence.

Wage rates prevailing in the area include: common labor, $1.90 per hr, bulldozer operator, $2.75, on the dredge, chief engineer $2.15, asst. engineer, $2.05, leverman, $2.15, mate, $1.65, shoreman, $1.45. Grass planters are piece workers, 25 cents a bundle to pick, 35 cents to plant.

Hydraulic fill and beach grass planting at Tiana Beach, Town of Southampton:

Item	Unit	Quantity	Unit price
Embankment in place	cy	120,000	$0.40
Beach grass	ac	20	300.00

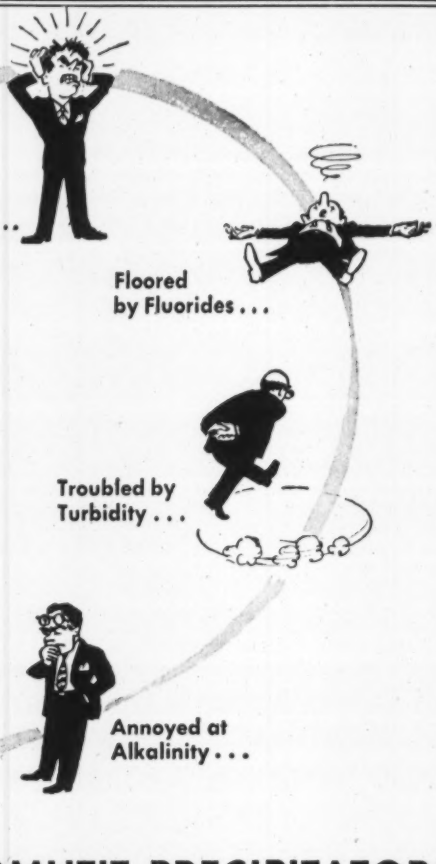
Gibson & Cushman, Inc., Bayshore, N. Y. only bidder. Let at same amount as engineer's estimate.

Arresting beach erosion, Towns of Brookhaven, Southampton and Easthampton:

1C McCollom & Murphy, Islip, N. Y.	$21,600
2 South Shore Constr. & Dredging Corp., Patchogue N. Y.	22,780
3 Davis Constr. Corp., Hicksville, N. Y.	23,800

Item	Unit	Quantity	Unit prices 1 C	2
Bulldozer units, incl crew	hr	1,000	$15.96	$17.56
Snow fence, furn & instl	lf	8,000	0.94	0.87

Men with WATER ON THE BRAIN . . .



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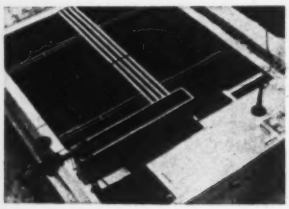

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Rattlesnake Dam, Colo.

The Bureau of Reclamation, Denver, Colo., L. N. McClellan, chief engineer, awarded Rattlesnake Dam contract to Adler Construction Co., on September 18, 1951 for a low bid of $825,279.75. This bid was 9% below the engineer's estimate, 8% below the second low and 22% under the high bid.

The contract for the dam, part of the Estes Park-Foothills Power Aqueduct, Colorado Big-Thompson Project, calls for an earth-fill dam, outlet works, spillway, access road and a transmission line. The dam embankment will be approximately 1,100′ long and 115′ in maximum height from bottom of cut-off trench to crest; trench will have a maximum bottom width of 120′. A concrete cut-off wall 5′ high will be constructed along center line of cut-off trench and foundation material will be pressure grouted. Embankment toe drains will be constructed under downstream toe of dam embankment. The central earth-fill zone 1 of the embankment, will be a mixture of selected clay, sand and gravel, 5″ maximum size from borrow areas, moistened and compacted to 6″ layers with tamping rollers. Upstream and downstream slopes of zones 1 & 2 will be protected and stabilized by rock-fines fill.

The spillway will consist of an inlet channel; concrete spillway structure with uncontrolled crest, chute, and footbridge; and an outlet channel.

All material is to be supplied by the contractor with the exception of the ventilating system for the outlet works gate chamber and access shaft, including thin-walled slip-joint pipe, pipe supports, ventilation intake and discharge outlet, motor-driven blower and supporting brackets; a main service disconnect switch, a load center containing circuit overcurrent protective devices, and a manual starting switch for the ventilating system's blower motor. These will be furnished by the Government. All Government materials will be delivered to the contractor for cars at Loveland, Colorado or at the Government warehouse at Walt Siding, Colorado. The contractor must haul all supplies from delivery points to the work and must provide storage.

Project is approximately 11 miles west of Loveland, Colorado. Work started Oct. 3 and is to be completed within 400 calendar days. Minimum wage rates are $1.37 for minimum labor; $1.575 for laborers; $1.65 for dump trucks to 6 yds load hauled and $1.75 for dump trucks 6 yds and over; $1.77 for miners, timbermen, machinemen, powdermen and blasters; $2.10 for carpenters; $2.20-$2.36 for power equipment operators, $2.25 for electricians; $2.31 for iron workers, reinforcing, $2.31 for shovels, draglines, backhoes, clamshells, derricks and cranes; $2.31 for tractors with power attachments.

Bidders include:

1C Adler Construction Co., Loveland, Colo.	$825,279.00
2 Colorado Constructors, Inc., Denver	883,020.00
4 Winston Bros. Co., Monrovia, Calif.	1,054,334.00

Bids: 9-12-51 Items	Unit	Quantity	Unit prices 1 C	2
Exc for fndn of dam embank	cy	38,000	$0.80	$1.25
Exc for outlet works	cy	1,700	2.65	7.00
Exc for spillway	cy	47,000	1.00	1.35
Exc for cutoffs	cy	800	26.50	16.40
Exc, strip borrow area	cy	22,000	0.26	0.20
Exc in borrow areas & transp to dam embank, zone 1, first 105,000 cy	cy	105,000	0.37	0.34
over 105,000 cy	cy	105,000	0.30	0.30
Earth fill in dam embank, zone 1, first 85,000 cy	cy	85,000	0.30	0.17
over 85,000 cy	cy	85,000	0.18	0.15
Ea fill dam embank, z 4	cy	25,000	0.16	0.25
Spec comp of ea fill in dam embank	cy	2,200	4.00	6.00
Rock fines fill in dam embank, zone 2a	cy	40,000	0.80	0.56
zone 2b	cy	45,000	1.50	1.50
Pl rock dam embank, z 3	cy	18,000	0.60	0.75
Rock fill in dam embank, zone 3, first 55,000 cy	cy	55,000	1.65	1.88
zone 3, over 55,000 cy	cy	55,000	1.55	1.65
Furn 8″ dia sewer pipe & const embank toe drns w uncmt joints	lf	500	2.00	2.50
Furn 4″ dia sewer pipe & const drns w uncmt joints	lf	500	1.80	1.90
8″	lf	550	2.80	2.30
F&I 4″ dia sewer pipe w cmt				
Drill grout holes in stage betw depths of 0′ & 35′	lf	3,300	2.10	3.60
35′ & 60′	lf	1,200	2.20	4.00
60′ & 110′	lf	500	2.40	5.55
F&p std black pipe & fittings for fndn grouting	lb	2,000	0.50	0.45
Pressure grouting	cf	3,300	2.25	3.30
Pr grtg with packers	cf	1,700	3.00	4.35
Drill holes for anchor bars & grtg bars in place	lf	8,110	1.00	0.75
Furn & handl cmt	bbl	6,265	5.35	4.80
F&p reinf bars	lb	300,800	0.15	0.156
Conc in cutoffs	cy	700	22.00	20.00
Conc in dam embank cutoff wall, exc foot	cy	180	54.00	41.00
Conc in outlet works intake struct & still well	cy	25	50.00	100.00
Conc in outlet works gate chamber & access shaft	cy	34	100.00	125.00
Conc in pipe encasement & cutoff collars	cy	75	40.00	20.00
Conc in spillway floor	cy	1,580	23.00	23.70
Conc in spillway crest	cy	705	19.00	17.50
Conc in spillway walls & bridge pier	cy	370	42.00	57.50
Conc in spillway ftbrl	cy	8	110.00	170.00
F&p bit-type jt filler	sf	80	1.50	1.60
F&p metal seals, type M1	lf	820	2.00	2.85
F&I cmt-lined CI pipe & fittings; stl bend & support; vlvs; & misc acces	ls	....	6,600	7,000
F&I chain-link fence	lf	800	3.50	2.70
F&I spillway ftbri metalwk	ls	....	4,600	3,000
Install vent system	ls	....	280.00	190.00
F&I misc metalwk	ls	....	2,400	4,400
F&I elec met cond 3/4″ & less in dia	lf	90	1.50	1.10
F&I elec met cond 1″ in dia	lf	100	2.00	1.40
F&I elec conductors & grounding materials	lb	50	3.00	2.80
Instal elec apparatus	lb	30	4.00	1.50
F&I interlock switch	ls		25.00	20.00
Exc for access road	cy	38,500	0.71	1.00
Overhaul exc for ac rd	stacy	5,000	0.05	0.05
Selected access rd surf	cy	2,400	1.40	1.50
Exc for access rd structs	cy	240	3.00	5.00
Bkfl for access rd structs	cy	860	4.50	4.50
Riprap for drainage channels	cy	70	4.50	7.00
Grav blanket under riprap for drainage channels	cy	25	5.00	6.00
Dry-rock pav for access rd drainage structs	sy	70	4.50	5.00
F&I 14-ga, 24″ dia CM pipe	lf	170	5.20	6.00
12-ga, 36″ dia	lf	46	10.50	11.00
12-ga, 54″ dia	lf	52	15.00	17.00
10-ga, 66″ dia	lf	120	23.00	27.00
F&e 8-ga, mult-plate CM stock pass	lf	128	55.00	60.00
F&e wire-cable gd fence	lf	365	3.60	2.40
Furn & set gd posts	ea	59	8.00	6.00
F&c H-5 type cattle gds	ea	2	450.00	950.00
H-15 cattle gds	ea	2	1,300	2,100
F&e barbed-wire fences	mi	4.8	1,500	1,500
F&I barbed-wire fence gates	ea	10	15.00	15.00
Remov barbed-wire fence	ea	3	300.00	400.00
Clear transmission line ROW	ls	....	1,300	300.00
Const type-HS struct using 50-, 55-, or 60′ poles	ea	1	375.00	500.00
65-, 70-, or 75′ poles	ea	1	475.00	585.00
Const type-HA struct using 55-, 60-, or 65′ poles	ea	1	420.00	400.00
Using 55-, 60-, or 65′ max pole length				
const type-3AB struct	ea	1	485.00	500.00
const type-3AC struct	ea	1	650.00	650.00
const type-3AT struct	ea	1	800.00	900.00
const type-3T struct	ea	1	650.00	1,500
Assemb & attach X-brace for 12′ pole spacing	ea	3	45.00	70.00
Const single guy	ea	10	30.00	50.00
double guy	ea	20	45.00	55.00
Const stub guy with 60′ pole	ea	1	180.00	275.00
Plac plate or cone anchor	ea	30	25.00	43.00
Plac grouted anchor	ea	1	40.00	43.00
Instal guy protectors	ea	5	10.00	26.00
Assemb & attach suspension-insul assembly w 7-insul units	ea	15	30.00	45.00
9-insul units	ea	6	40.00	49.00
Assemb & attach double tension-insul assemb w 9-insul units per string & double strain yoke	ea	18	85.00	130.00
String 3-397, 500-circ mil ACSR conductors	mi	0.4	4,000	4,450
Attach vibr damper to ACSR conductors	ea	24	11.00	43.00
Attach vibr damper to over-hd ground wire	ea	4	11.00	30.00
Attach 50-lb hold-down wt for susp insulators	ea	3	22.00	35.00
String 2-3, 8″, galv-stl overhd ground wires	mi	0.5	1,000	1,600
Pl fence ground post & grounding fences	ea	5	8.00	30.00
Remov exist 115-kv, 3-ph, single-circ trans line	mi	0.3	3,100	4,000

Water storage, Idaho

Water supply storage at Mountain Home Air Force Base, Elmore County, Idaho calls for a 75,000-gal elevated steel water tank and a 1,000,000-gal concrete ground storage tank with alternate bids on a 250,000-gal elevated steel tank. Two bids were received June 23, 1951 by Resident Engineer, Corps of Engineers, Boise, Idaho, calling for completion 180 days after notice to proceed. Both were above the government estimate but award was made to the low bidder on the basis of the 250,000-gal tank.

Lump sum bids for designing, manufacturing and erecting the elevated steel tanks complete with all appurtenances and connections produced unit costs of $0.508 per gal of capacity for the 75,000-gal tank and of $0.271 per gal for the 250,000-gal tank. The concrete ground storage tank low lump sum bid works out at $0.094 per gal of capacity.

Wage rate minimums on this job are: carpenters, $2.00; structural ironworkers, $2.225; boilermakers, $2.53; plumbers, $2.25; air compressor operators, $1.80, crane operator, $2.20; common labor, $1.50.

Bidders were:

1C J. H. Wise & Son, Inc., Boise, Idaho	$227,154
2 J. A. Terteling & Sons, Inc., Boise, Idaho	261,124

Bids: 6-23-51 Items	Unit	Quantity	Unit prices 1 C	2
Steel piling, f&d	lf	400	$10.00	$9.00
Steel tank, 75Mgal, dm&e	ls	1	38,071.00	48,950.00
Exc, uncl	cy	4,300	1.18	1.30
Conc for level fdn	cy	600	29.75	46.05
Conc pr stor tank, 1,000 Mgal	ls	1	94,035.00	112,000.00
Aux pwr unit for well pmp	ls	1	17,873.00	12,165.00
Pipe connect to exist syst	ls	1	10,407.00	11,565.00
Gravel fill	cy	570	3.30	2.30
Dismantle, salv & stk pile wood stave tanks	ls	1	3,356.00	1,575.00
Steel piling, f&d	lf	1,050	8.50	8.75
Steel tank, 250Mgal, dm&e	ls	1	67,753.00	80,100.00

Water and sewer lines at state hospital, Md.

The State Department of Public Improvements, Baltimore, Md., took bids in June, 1951 on water distribution system, sanitary sewers and storm drains for the Spring Grove State Hospital in Catonsville, Md. to cost $118,833.

The work involved is indicated by the unit prices which follow.

Wage rates are $1.38 per hr for common labor, $2.42 for carpenters.

Bidders include:

1C W. F. Wilson & Sons, Inc., Brookeville, Md.	$118,832 65
2 Peter D'Adamo, Baltimore Md.	132,759 78

June, 1951 Items	Unit	Quantity	Unit prices 1 C	2
Part A				
8" CI main, comp incl exc & refill	lf	7,960	$4 20	$4 06
6"	lf	1,000	3 40	3 32
4"	lf	80	2 80	2 68
3"	lf	320	2 65	2 64
CI D fittgs in pl	ton	10	400 00	400 00
6" fire hyd, comp	ea	13	188 20	246 00
8" gate valve & box, comp	ea	12	105 00	149 00
6"	ea	16	75 00	119 00
4"	ea	3	40 00	99 00
3"	ea	4	40 00	79 00
Mass conc for buttresses	cy	20	60 00	40 00
Replace paved & tr sts	sy	70	12 00	3 44
Replace cinder rds	sy	50	1 20	2 60
Replace conc walks	sy	13	6 50	6 30
Replace crushed st wks	sy	3	1 50	4 00
Lumber, lip	Mfbm	1	80 00	90 00
Exc & refill below sub-gr	cy	10	7 00	4 00
Replace conc curb & gutr	lf	200	2 00	2 90
Site improve cleanup topsoil	ls		1,500	5,204
Cuttg in & connectg to exist mains	ea	8	115 00	100 00
Rock excavation	cy		15 00	12 00
Part B				
Water pump, comp	ls		3,000	3,381
8" VC storm drain, comp incl exc & refill	lf	125	3 70	2 40
Catch basin, comp	ea	1	200 00	219 00
Rock excavation	cy		15 00	12 00
Part C				
8" CI main comp in pl	lf	2,680	4 20	4 05
6"	lf	240	3 45	3 30
4"	lf	40	2 75	2 70
CI D CI fittgs in place	ton	2	400 00	400 00
6" fire hyd in pl	ea	2	188 00	246 00
8" valves & boxes in pl	ea	2	105 00	149 00
6" gate valve & box, comp	ea	2	75 00	119 00
4" gate valve & box, comp	ea	2	40 00	99 00
Mass conc for buttresses	cy	4	60 00	40 00
Replace paved & tr streets	sy	10	12 00	5 50
Replace cinder roads	sy	10	1 20	2 60
Lumber, lip	Mfbm	1	80 00	90 00
Exc & refill below sub gr	cy	10	7 00	4 00
Site improvement	ls		500 00	4,559
Rock excavation	cy		15 00	12 00
Part D				
8" VC sanitary sewer, comp	lf	2,190	3 30	3 39
6"	lf	38	3 10	2 19
8" CI	lf	33	5 75	4 58
8" x 6" VC wye branch in pl	ea	5	6 00	5 00
6" VC 1 8 bend in pl	ea		3 00	3 00
8" x 8" VC wye branch in pl	ea		7 00	6 00
8" VC 1 8 bend in pl	ea		3 50	5 00
Manhole less fr & cov	vf	55	26 00	26 40
Manhole frames & covers	ea	9	50 00	40 00
8" drop connection	ea	4	75 00	50 00
8" main line clean out	ea	6	75 00	90 00
Repl paved & tr streets	sy	12	12 00	3 44
Lumber, lip	Mfbm	1	80 00	90 00
Exc & ref below sub-gr	cy	10	7 00	6 00
Site improvement	ls		450 00	2,065
Abandg septic tank incl remov top, pump out, bckfil comp	ea	2	150 00	600 00
Connect to exist san sewer	ea	2	50 00	100 00
Rock excavation	cy		15 00	12 00
Part E				
30" storm drains, comp	lf		8 50	9 00
24"	lf		6 50	8 65
18"	lf		5 60	5 15
15"	lf		5 25	5 62
12"	lf		4 70	4 71
8" VC storm drains, comp	lf	618	3 10	3 85
4" VC storm drains, comp	lf	432	2 50	3 04
15" x 4" VC Y branch in pl	ea	5	10 00	11 00
12" x 4"	ea	11	8 00	7 00
8" x 4"	ea	17	6 00	5 00

Items	Unit	Quantity	Unit prices 1 C	2
4" 1 8 bend in place	ea	33	1 00	3 00
Std MH comp fr & cov	ea	13	240 00	250 00
Shallow MH fr & cov	ea	5	240 00	250 00
Main line cleanout incl frame & cover	lf	5	75 00	90 00
Type E comb-inlet comp	lf	26	300 00	300 00
Park type inlet comp	lf	2	200 00	139 00
Conc headwalls in place	cy	13	55 00	39 00
Replace paved & tr sts	sy	7	12 00	4 00
Ditch excavation	lf	358	1 00	0 90
Rip rap in place	sy	90	12 00	9 00
Lumber left in place	Mfbm	1	80 00	90 00
Site improvement	ls		200 00	1,600
Rock excavation	cy		15 00	12 00
Exc & refill below sub-gr	cy	10	7 00	6 00
6" Perf ACCM pipe in place	lf	100	2 00	2 85
4' x 4' box culvert	ls		4,500	4,307

Reservoir, Oakland, Calif.

The low bid, June 11, 1951 for building a 3-mg reservoir was $117,850 with only two bidders competing. The East Bay Municipal Utility District, Oakland wants the job completed in 11 months, but start of construction was held up awaiting federal authorization for materials, all of which are to be furnished by the contractor. The reservoir is 130 ft in diameter and 27 ft high. The job is 5 miles from a railroad.

Wage rates range from $1.95 for skilled labor, $1.80 for semi-skilled to $1.70 for common labor.

Bidders were:

1C Elmer J. Freethy, El Cerrito, Calif.	$117,850
2 Haas & Rothschild, San Francisco, Calif.	146,793

Bids: 6-11-51 Items	Unit	Quantity	Unit prices 1 C	2
Exc for reservoir	cy	10,000	$1 40	$2 00
Backfill, reservoir	cy	570	1 20	3 00
Pipe, exc & backfill	cy	30	12 00	7 00
Inst 6" CI pipe	lf	85	2 00	4 00
8"	lf	85	2 00	5 00
12"	lf	50	4 00	6 00
Conc reservoir and pit	cy	925	65 40	77 00
Conc gutter	lf	320	1 00	1 50
Conc pipe anchors	cy	1 2	100 00	100 00
Furn cement	bbl	1,180	4 00	4 40
Furn pozzolan	cwt	224	2 00	2 00
Reinf bars	lb	101,250	0 114	0 13
Wire wrapping	ls		14,410 00	16,631 00
Gunite, outside reserv	ls		3,500 00	4,500 00
Bottom seal, inst	ls		750 00	100 00
Copper downspouts	ls		450 00	700 00
Tile drains & risers	ls		1,000 00	1,400 00
Pipe, valves, fittgs, inst	ls		200 00	1,300 00
Valve pit cover	ls		221 00	350 00
Misc steel work	ls		2,300 00	3,700 00
Conc backfill	cy	70	20 00	20 00
Grade entrance road	ls		250 00	2,000 00

Water supply line, Ark.

Four bidders competed for work on June 5, 1951 which will bring water to a 3 sq mi area adjacent to North Little Rock. E. W. Daniel Plumbing & Heating Co. was awarded the contract by the Ambov-Oak Grove Water Pipe Line Improvement Dist. No. 2 of Pulaski Co., Little Rock, Arkansas for a low bid of $91,275.40 which was later adjusted to $87,000 due to quantity changes. Alternate bids were asked on cast iron pipe and cement asbestos pipe; unit prices were lower for the latter material. Static pressure is 150 psi. The low bid was 2% below the next low bid and 4% below the high. The engineers are Dickinson & White of Little Rock, Arkansas.

Work began on September 15, 1951 and must be completed by December 1, 1951. This contract is for the pipe line only; services, meters and fire hydrants will be covered by others or other contracts. Meters, meter setting and boxes, service pipe and corporation stops are furnished by the owner.

Wages for skilled labor are $1.75 an hour; $1.25 an hour for semi-skilled labor; $0.75 an hour for common labor. The job is 4 to 8 miles from a railroad.

Bidders include:

1C E. W. Daniel Plumbing & Heating Co., Little Rock, Ark.	$91,275 40 CA 99,231 30 CI
2 Worth James, Little Rock, Ark.	93,307 44 CA
	96,575 77 CI
4 Griffin Constr. Co., Merriam, Kan.	94,625 00 CA 93,295 00 CI

Bids: 6-5-51 Items	Unit	Quantity	Unit prices 1 C	2
8" CI pipe	lf	16,600	$3 49	$3 55
6"	lf	2,500	2 61	2 62
4"	lf	3,100	1 93	1 85
2"	lf	20,600	1 21	1 04
2" valves & boxes	ea	11	36 80	36 41
Alternate-contract				
8" CA pipe	lf	16,600	3 01	3 01
6"	lf	2,500	2 30	2 24
4"	lf	3,100	1 62	1 53
3"	lf	20,600	1 29	1 40
3" valves & boxes	ea	11	45 90	59 38
CI specials	lb	8,000	0 19	0 22
8" check valve	ea	1	137 50	159 42
8" valves & boxes	ea	3	105 00	116 74
6" valve & box	ea	1	80 00	77 04
4" valve & box	ea	1	57 50	59 38
8" master meter	ea	1	825 00	750 20
Rock exc	y	10	10 00	8 00
Sterilization	ls	1	250 00	150 00
Misc conc	cy	5	35 00	30 00

Sewage treatment, N. Y.

All nine bids, June 29, 1951, on the supersonic trainer building at James Connally Air Force Base at Waco, Tex. were below the "reasonable contract estimate" of the District Engineer, Corps of Engineers, Fort Worth, Tex. The contract went to the low bidder at $446,728, 22% below the contract estimate but within half a percent of the next bid.

The building, 26,992 sq ft, accounts for $436,604 of the total bid, a cost per sq ft of $16.18. The rest of the cost goes into utility lines.

Work had to start within 5 calendar days of notice to proceed and have building ready for use not later than Dec. 1, 1951.

Minimum wage rates were set at $3.25 for bricklayers, $2.125 for carpenters, $2.50 for cement finishers, $2.40 for electricians, $2.40 for structural iron workers, $1.625 to $2.375 for equipment operators, $1.00 per hr for laborers.

Bidders included:

1C Ed Johnson, Waco, Tex.	$446,728
2 McClellan-Brown-McClellan, Waco, Tex.	449,938
9 Hicks Construction Co., Waco, Tex.	583,543

Item	Unit	Quantity	Unit prices 1 C	2
Sunerson tr bldg, 26,992 sf	ea	1	$436,604.00	$439,411.00
6" water line	lf	805	4 20	4 62
3" water line	lf	230	2 00	1 88
3" gas line	lf	175	4 00	3 06
1 1 2" gas line	lf	215	1 00	1 08
6" sanitary sewer	lf	190	2 00	1 82
4" sanitary sewer	lf	20	2 00	78
3" gas valve	ea	1	35 00	35 20
V/v box, 6" water line	ea	1	15 00	14 52
V/v box, 3" gas valve	ea	1	15 00	14 52
6" x 4" sewer wye	ea	1	2 00	2 22
Sewer manhole	ea	2	300 00	305 53
Outside elect util	ls	Job	3,300 00	3,555 20
Exc, trench & bkfl	lf	1,635	60	54

Continued on following page

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Natural SCOOPING ACTION
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The hydraulically controlled bucket of the LULL Shoveloader scoops instead of pushes the earth into the bucket, so it naturally moves more earth in less time.

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BALDWIN-LIMA-HAMILTON

Sewage treatment, N. Y.

Continued from preceding page

Items	Unit	Quantity	Unit prices 1 C	2
8" Fl plug valves	ea	7	175.00	150.00
8" Fl plug valves	ea	8	250.00	270.00
Filter stone	cy	2,150	6.00	7.00
Filter underdrains	sy	1,822	10.00	6.75
Rot distr for 105' dia filters	ls	1	22,000.00	20,000.00
Clarif equip for 105' dia final tanks	ls	1	37,000.00	38,000.00
Digester equip compl	ls	1	18,000.00	20,000.00
Adjustable weirs & baffles in weir chamber	ls	1	3,500.00	2,500.00
Sand for sludge beds	cy	130	7.00	6.00
Stone for sludge beds	cy	170	8.00	7.00
Lumber for sludge beds	ls	1	1,000.00	800.00
Underdr sys for sl beds	ls	1	1,500.00	1,000.00
Gl enclos & monorail sys for sl beds(use present monorail sys)	ls	1	67,000.00	70,000.00
Pump equip, valves, piping & controls	ls	1	23,000.00	27,600.00
Pump station superstr	ls	1	18,000.00	16,500.00
Storm water inlets & drain line compl	ls	1	1,500.00	1,200.00
Water line, vlvs & hyd compl	ls	1	7,500.00	4,800.00
30" RC pipe in pl	lf	985	12.00	8.75
Manholes	ea	8	300.00	250.00
Scuppers in final tank	ls	1	8,000.00	6,200.00
Sl pump equip compl	ls	1	7,000.00	6,200.00
Improvements to present digesters	ls	1	18,000.00	24,000.00
Trans & recording equip for Parshall flumes	ls	1	3,000.00	2,300.00
Hose valves in sl beds	ls	1	200.00	130.00
Grav'or rdwys and sidewalks	cy	125	8.00	5.00
Misc. small piping, etc	ls	1	7,000.00	5,500.00
18" D.O. valve and box & 18" connect to pres clarifier tanks	ls	1	1,500.00	700.00
Electrical work	ls	1	22,000.00	20,000.00
Fdn stone or grav	cy	100	7.00	7.00
Wooden foundation pipes	lf	500	4.00	3.00
Vit tile underdr, compl	lf	820	4.00	3.00
(Alt) glass enclos & monorail sys for sl beds (new monorail system)	ls		70,000.00	73,000.00

Sanitary sewer, Conn.

Low bidder, Paul Bacco & Sons, was awarded contract for the Canal St.-Atlantic trunk line sanitary sewer in Stamford, Conn. on bids taken March 27. This bid was 30% below the American Construction Company Inc., the only other competitor. Leon E. Tuttle is city engineer.

Work started May 28, 1951. Completion date was set at the end of 400 days by the low bidder and at 250 days by the second bidder. The distance of the project from a railroad is .05 miles.

Wage rates are $1.75 per hour for common labor; $2.30 per hour for shovel operators; $2.50 for masons.

Bidders were:

1C Paul Bacco & Son, Stamford, Conn.	$562,968.80
2 American Construction Co. Inc., Hartford, Conn.	799,720.00

Bids: 3-27-51

Items	Unit	Quantity	Unit prices 1 C	2
Bank run grav	cy	3,000	$1.50	$4.00
Screened grav	cy	1,000	2.00	6.00
Native crushed stone	cy	1,520	3.50	6.00
Grade C conc	cy	130	18.00	30.00
Shoring left in place	Mfbm	80	60.00	80.00
Conc cradle	lf	1,460	14.00	12.00
Piles (untreated)	lf	7,000	2.00	2.00
12" ext str tile pipe, latls	lf	200	26.00	20.00
10"	lf	200	25.00	20.00
8"	lf	200	25.00	18.00
6"	lf	200	25.00	18.00
Rock exc	cy	2,475	10.00	10.00
Blue stone curb remov	lf	600	0.50	0.50
Anchor post fence r & r	lf	260	2.00	1.50
Single trolley rail remov	lf	750	0.75	1.00
Parking meters r & r	ea	5	10.00	10.00
White way light pole r & r	ea	2	100.00	60.00
Fire hydrant r & r	ea	1	100.00	100.00
Conc curb in place	lf	1,000	2.25	2.50
Conc sidewalk	sf	5,000	0.70	0.55
Conc crosswalk	sf	100	0.70	1.00
Std catch basins	ea	4	250.00	300.00
Conc saddle	lf	50	2.50	2.50
36" ext str tile pipe	lf	247	68.00	100.00
36"	lf	383	64.00	100.00
36"	lf	957	64.50	100.00
30"	lf	173	63.00	100.00
18"	lf	25	28.00	68.00
30"	lf	135	56.50	84.00
36"	lf	740	66.00	84.00
36"	lf	2,339	53.20	74.00
15"	lf	22	27.00	60.00
24"	lf	508	29.20	50.00
18"	lf	671	23.90	65.00
18" Ext str RC culv pipe	lf	360	6.00	15.00
12" RC pipe latls	lf	100	5.75	10.00
Std MH, hard bk const	vf	176	35.00	75.00
slip joint pipe const	vf	176	35.00	75.00
hard bk const	vf	290	35.00	75.00
slip joint pipe const	vf	290	35.00	75.00
hard bk const	vf	12	90.00	100.00
storm sewer	vf	25	30.00	45.00
Drop MH conn	vf	34	30.00	50.00
8" reinf conc pave base	sy	5,000	4.50	9.00
Bit pavement	sy	5,570	3.00	3.20
Oiled grav rd	sy	800	1.75	1.80
Extra binder	ton	400	14.00	15.00
Asph conc type pavement	sy	5,000	3.60	3.80
Colprovia type pavement	sy	5,000	3.60	3.80
Asph conc type resurf	sy	3,000	2.40	2.50
Colprovia type resurf	sy	3,000	2.40	2.50
MH fr & cov raised to gr	ea	14	50.00	60.00
Catch basin reconstr	ea	9	75.00	400.00
8" reinf conc pavement	sy	975	7.00	10.00
Asph conc type resurf	sy	10,750	2.40	2.50
Colprovia type resurf	sy	10,750	2.40	2.50
5" reinf conc resurf	sy	350	3.50	7.00
Bit pave resurf remov	sy	500	1.00	1.25

* r & r remove & replace * vf vert ft

Sewage treatment plant, Vt.

To clean up its pollution of Lake Champlain, Burlington, Vt. is building a sewage treatment plant and 8,000 ft of interceptor sewers at a total cost of $647,851. Whitman & Howard, Boston, Mass. are the engineers.

After rejecting earlier bids, contracts were awarded on bids received Sept. 13, 1951 for construction of interceptor sewers, a treatment plant and a small sewage pumping station, to be completed in 12 months.

Burlington's existing sewer system consists, almost entirely of combined storm and sanitary sewers of considerable size. Both the existing 8'x8'-6" trunk sewer and a 6-ft dia brick sewer lie at, or below, the normal lake level. Existing conditions require construction of several manholes with orifice plates and overflow weirs to control quantity of sewage intercepted during storm flows. The air-ejector plant will pump sewage from the Lakeside area into the interceptor sewers. All other sewage flow to the treatment plant site is by gravity.

The treatment plant site is on low land where the possible high water level makes it necessary to pump all raw sewage through the plant. Plant effluent will be discharged to the lake through the existing trunk sewer.

The sewage treatment plant provides for primary treatment, metering, screening and grinding, grit removal, primary sedimentation, and chlorination either before or after the plant. Two-stage sludge digestion with use of digester gas for heating is provided, also sludge dewatering by vacuum filters.

Wages rates in this area include: carpenters, $2.00; bricklayers, $2.75; laborers, $1.38; inside electricians, $1.75; glaziers, $1.60; plumbers and steamfitters, $2.25.

Bidders include:

For interceptor sewers:

1C D'Alessandro-Crognale, Inc., Hyde Park, Mass.	$142,350
2 P. DiMascio & Son, Dorchester, Mass.	149,011
8 Jalco Construction Co., Norwood, Mass.	225,714

Bids: 9-13-51

Items	Unit	Quantity	Unit prices 1 C	2
30" ex str RC sew pipe & 12 ft 30" Cl pipe	lf	230	$19.00	$38.00
24" ex str RC sew pipe	lf	580	15.00	20.00
24" std str RC sew pipe	lf	490	13.00	16.00
18"	lf	2,550	13.00	12.00
15"	lf	2,700	9.00	10.00
12"	lf	140	7.00	9.00
10" ex str VC sew pipe	lf	670	7.00	10.00
8"	lf	250	7.00	8.00
8" clCI force main	lf	980	10.00	7.00
8" CI siph pipes bet MH 3 & MH 5, incl conn to MH, clean-out piping, etc	ea	2	1,400.00	1,250.00
Std brk MH, 3.5'-7.5' dp, av 6' dp	ea	18	325.00	200.00
Std brk MH, abt 9' dp	ea	2	325.00	250.00
abt 12.5' dp	ea	3	400.00	285.00
Spec conc MH #1	ea	1	1,000.00	700.00
MH #2	ea	1	500.00	750.00
Spec brk MH #3	ea	1	1,000.00	400.00
Spec conc MH #4	ea	1	2,000.00	2,800.00
MH #5	ea	1	2,000.00	2,300.00
Spec brk MH #8	ea	1	1,000.00	500.00
Spec brk & conc MH #9	ea	1	1,000.00	2,500.00
Spec conc MH #18	ea	1	500.00	1,400.00
MH #17	ea	1	500.00	1,500.00
MH #18	ea	1	500.00	2,000.00
MH #23	ea	1	500.00	500.00
Spec brk MH #29	ea	1	500.00	400.00
MH #31	ea	1	500.00	400.00
MH #35	ea	1	500.00	500.00
Ledge or rock exc	cy	100	8.00	20.00
Pl conc excl of conc used for MH, spillwy, culv, etc	cy	70	18.00	25.00
Pl conc under Pine St. pipe encase	cy	80	17.00	20.00
8" RC pipe encase	cy	600	27.00	20.00
Exc bel sew pipe grade, incl f&r with grav stone, etc	cy	50	8.00	10.00
Spruce lumb used for sh & shor, lip	Mfbm	3	200.00	150.00
3" bit conc surf	sy	150	5.00	5.00
Bit mac rd surf	sy	100	7.00	5.00
Conc sidewk	sy	250	2.25	6.00
Exmerimnt trench	cy	50	3.00	5.00
Build conc spillwy nr MH 31, reloc brook, grad, etc	ls		2,150.00	1,200.00
Bldg conc culv, hdwl & inl box, nr MH 22	ls		880.00	2,000.00

Sewage treatment plant and ejector station

1C Halloran, Hollen & Riva Co., Providence, R. I.	$505,500
2 Samuel Aceto & Co., Portland, Me.	558,000
6 Westcott Constr. Co., North Attleboro, Mass.	634,400

Bids: 9-13-51

Items	Lump sum bids 1 C	2
Ejector station, complete, incl wiring, equip, incidental piping, grading, etc.	$18,500	$20,000
Treatment plant complete with appurt structs, piping, equip, grading, roads, etc.	488,000	520,000
Alt.—same except digesters constructed of prestressed concrete	487,000	538,000

Capacities:

INTERCEPTOR SEWERS: 10 mgd, contract price $142,351, $14,235/mgd

EJECTOR: 150 gpm, contract price $18,500, $123.33/gpm

TREATMENT PLANT: 3.7 mgd, design flow, contract price $487,000, $131,622/mgd des flow 10 mgd, maximum capacity, $48,700/mgd max cap.

RAW SEWAGE PUMPS: three 2500 gpm pumps powered by float operated variable speed motors

RAW SLUDGE: two plunger pumps

TWO PRESTRESSED CIRCULAR TANKS: 45 ft in dia, 24 ft side water depth

Digesters will be provided with vertical heating coils, a mixer for agitating the sludge and one floating gas storage cover.

Digested sludge will be drawn to a sludge well under the administration building. There it will be conditioned with lime and ferric chloride and dewatered on a 250 sf coil spring vacuum filter. Dewatered sludge will be carried on belt conveyors to a truck for ultimate disposal on a suitable dump.

ADMINISTRATION BUILDING: 100 ft x 40 ft, will be control center for plant.

This building will provide an office where the main electric control panel will be located, a laboratory, chlorination rooms, boiler room, pumping room, vacuum filter room, storage room for chemicals, lavatory and locker space.

Pump room will contain the raw sewage pumps, sludge pumps, vacuum pump, filtrate pump and vacuum receiver.

Boiler room provides space for two boilers, one gas fired, the other oil fired, also the usual gas safety appliances and metering devices. Digester gas will be used as the source of heat for the administration building as well as the digesters. Oil will provide supplementary heat as needed.

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MILL EXTENSIONS

IDLEWILD AIRPORT
Administration Building
Port of N. Y. Authority
FOUNDATIONS

U. S. NAVAL AIRPORT
Fentress, Va.
DRAINAGE

U. S. AIR FORCE
Mitchell Field
SEWERS

DEPT. PUBLIC WORKS
Nassau County, N. Y.
SEWAGE DISPOSAL

INDIANAPOLIS LIGHT & POWER CO.
White River Generating Station
Campbell, Ind.
FOUNDATIONS

25 YEARS EXPERIENCE

Foundation Equipment Corporation

Long Island City 1, N. Y.
38th Ave. & 10th St.
EXeter 2-1100

Chicago, Illinois
2608 W. 111th St.
HIlltop 5-1545

Sewerage system, Tex.

On July 3, 1951 five contractors submitted bids ranging from $33,993 to $39,775 for constructing a sewage disposal plant and complete collection system for Hedley, Tex. Geo. W. Thompson, Pampa, Tex. is engineer.

The Imhoff tank is 12'x24' by 23' deep, inside. Work started July 31 and was to be completed within 75 working days. The disposal plant is 2 mi from the railroad.

All vitrified tile pipe and fittings are furnished by the city, also all CI pipe and fittings, all manhole bricks, rings, covers and CI steps, all cleanout castings, two 8" gate valves and 900 sacks of cement.

Wages to be paid are $1.75 for skilled, $1.25 for semi-skilled and $1.00 for common labor.

Bidders include:

1C Harrison & Shirley, Canyon, Tex.	$33,993
2 S. E. Lanier, Haskell, Tex.	34,824
5 Bill Wilson, Perryton, Tex.	39,775

Bids: 7-3-51 Items	Unit	Quantity	Unit prices 1 C	2
8" VT pipe laid	lf	7,700	0 50	0 50
6" VT pipe laid	lf	17,800	0 40	0 45
4" VT pipe risers	lf	200	1 00	0 80
8" B&S CI pipe laid	lf	54	1 00	2 00
6" B&S CI pipe laid	lf	54	1 00	1 50
Sewer manhole drops	ea	1	50 00	30 00
Rock exc in tr	cy	200	6 00	1 00
Rock exc in str	cy	100	4 00	1 00
Sewer manholes 0-4'	ea	2	50 00	60 00
4-8'	ea	37	60 00	80 00
8-8'	ea	15	75 00	100 00
8-10'	ea	1	90 00	120 00
10-12'	ea	5	105 00	150 00
Sewer cleanouts	ea	12	20 00	20 00
Trench & backfill 0-4'	lf	500	0 25	0 25
4-6'	lf	16,500	0 30	0 30
6-8'	lf	6,000	0 35	0 40
8-10'	lf	800	0 45	0 50
10-12'	lf	1,500	0 60	0 65
Disposal plant	ls	1	9,500 00	7,500 00
Excav for Effluent Storage*	cy	5,000	0 50	0 40
6" concrete pavement	sy	30	7 50	6 00
4" concrete walk	sf	80	1 00	1 00
Extra work @ hwy crossing	ea	2	50 00	130 00

/ Probably will not be needed * Item withdrawn

Steam tunnel, Washington

Lump sum bids were taken on the $4,583,783 reinforced concrete pipe tunnel from the Capitol Power Plant to Senate Office Building, Washington, D. C. The Office of the Architect of the Capitol received six bids on August 14, 1951 for main tunnel 10½ by 11½ ft inside diameter, approx 5,400 ft long, with tunnel connections to buildings approximately of 375 ft, average invert, 30 ft. The contractor furnishes and installs duplicate 16-in steam lines, 6-in condensate return line, and duplicate 30-in chilled water lines. Guy B. Panero, New York, N. Y. and Washington, D. C. is the consultant.

The job is three miles from a railroad and the contractor has 562 calendar days to complete the job.

Prevailing wages are $2.875-2.675 for skilled labor; $2.675-2.375 for semi- and $1.775 for unskilled.

Alternate bids show amount to be deducted from principal bid if insulation is omitted from steam, condensate and chilled water lines.

Bidders include:

1C	Chas. H. Tompkins Co., Washington, D. C.	$4,583,783 Alt. 346,000
2	John McShain, Inc., Philadelphia, Pa.	4,797,200 Alt. 305,000
6	Square Constr. Co., Deluca-Davis Constr. Co., Baltimore, Md.	5,845,000 Alt. 330,000

These costs average out at $848.80 per lineal foot of main tunnel for the overall contract and an average deduct on of $84.10 per lineal foot of main line tunnel if the pipe insulation is omitted.

Pneumatic vacuum ash system, N. Y.

New York City's Board of Transportation received two lump sum bids on Sept. 13, 1951 for the complete pneumatic vacuum ash system with accessories and rotary dustless ash unloader equipment installed in the 74th St. Power Plant with maximum escalation set at 10%. J. G. White Engineering Corp., New York, is consulting engineer.

Bids and escalation are:

1C	Poirer & McLane Corp., New York	$392,800
2	Courter & Co., Inc., New York	400,200

Bids: 9-13-51 Item	Lump sums 1C	2
Compl pneu-vac ash syst	$358,900	$367,700
Max escalation 10%		
Matl cost to contr	(250,000)	(265,000
escalation	25,000	26,500
Fld erect labor cost to contr	(90,000)	(90,000)
escalation	9,000	6,000

Capacity of this plant is 10,000 lb of ash per hour, designed to serve two 450,000-lb-per-hr steam boilers. Cost per M lb of ash per hr is $39,280.

Disposal of ash at sea costs $1.50/t.

Cost of disposal of fly ash by inland cities is reported at $0.70 per ton (ENR 9-27-51, p. 52). Commonwealth Edison, Chicago, sold it for $1 a ton for use with cement in Hungry Horse Dam. Detroit Edison Co. successfully markets it, at $2 per ton fob plant in bulk and at $7 per ton bagged.

Incinerator costs per ton of capacity

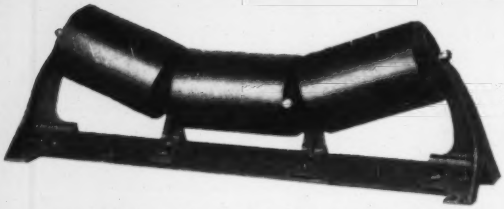
From data supplied by consulting and city engineers

Location	Size t/24hr	Date Built	Buildings & Grounds $/t	%	Furnaces $/t	%	Chimneys $/t	%	Total $/t-100%
Milwaukee, Wis.	300	1909	$321	47	$348	51	$15	2	$684
			181a		348		15		544a
									1,000a
Buffalo, NY.	500	1926	...		...		...		
Dist of Col., O St.	425	1932	412	54	295	39	49	6	756
Dist of Col., Georgetown	170	1932	685	69	235	24	76	8	996
Charleston, SC	200	1934	...		...		...		830b
Newton, Mass.	120	1934	660	51	540	42	100	8	1,300
Manchester, NH	150	1937	460	51	379	42	51	6	894
Newport, RI	100	1938	...		...		...		1,150
Peekskill, NY	110	1938	...		...		...		960
New Rochelle, NY	250	1938	...		...		...		960c
Rochester, NY	200	1938	854	48	776	43	165	9	1,795d
Cedar Rapids, Ia.	150	1939	...		...		...		944e
Greenwich, Conn.	150	1939	◄	1,147e (91.5%)	►		107	8.5	1,253
Cambridge, Mass.	200	1939	...		...		...		942f
Dayton, Ohio	150	1940	...		...		...		1,240f
Honolulu, TH	400	1944	1,781	67	670	25	199	8	2,650g
Lyttonsville, Md.	150	1946	...		...		...		1,658
Winnecoe, Can.	400	1946	1,090	56.3	733	37.8	112	5.8	1,935
Carmel, NY	40	1947	1,035	53.3	733	37.8	172	8.9	1,940
Mt Kisco, NY	40	1948	1,384	58.4	748	31.6	238	10.0	2,370
Beverly Hills, Calif.	300	1948	...		...		...		1,153f
New York, NY, Betts Ave	800	1948	...		...		...		5,076h
Troy, NY	250	1948	...		...		...		1,545e
Staunton, Va.	50	1949	...		...		...		1,668
Arlington, Va	300	1949	...		...		...		2,167
Los Angeles, Lacy St.	400	1950	...		...		...		2,11i
Alhambra, Calif.	150	1950	...		...		...		1,693
Lawrence, Mass.	300	1950	1,003	59	561	33	149	9	1,713
Yonkers, NY	450	1950	1,329	58	695	30	266	12j	2,240j
Brookline, Mass.	300	1950	1,462	58	813	32	227	9	2,502
Warren, Ohio	195	1950	657	63.6	300	29.0	76	7.4	1,033
Waterbury, Conn.	300	1950	777	60.3	439	34.1	73	5.7	1,289
Hempstead, NY	700	1950	...		...		...		3,240k
Brookline, Mass.		1950	3,333a	80	...		...		4,167a
Glendale, Calif.	225 & 112.5	1951	1,215l	53.6	920l	40.5	133l	5.9	2,268l
San Pedro, Calif.	72m	1951	1,065a	49.3	◄	1,097 (50.7%)	►		2,162
Buffalo, NY	500	1951	...		...		...		3,000
Clairton, Pa.	120	1951n	1,750	53.5	1,120	34.3	400	12.2	3,270a
			1,410o	52.8	1,000o	37.5	260o	9.7	2,670o

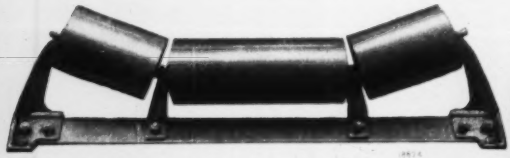
a excludes boilers and generating equipment b mixed, 65% garbage, 35% combustibles, grounds city owned prior to building c not crane fed, built under Civil Wks Adm d incl waste-heat boiler insdn e 2 furnaces, 1 chimney f incl waste-heat boiler instln & appart for furn steam to garbage reduction plant or for sale g grounds not incl h grounds $200 t, bldgs & furnaces, $947 t i 3 furnaces, 9 hoppers, 115-ft chimney j incl waste-heat instln for drying or incinerating sewage sludge k 2 separate but similar plants 200t ea, $1,760 estimated for mainland, Honolulu prices estimated 50% higher l no storage pit m structure & equip $4,425 t, demol old bldg, elect, plumb, heat & vent, port equip $851 t; 2 250-ft brick stacks, 40 3-t garbage trucks, hr, receiving pit; 2 high speed cranes for lifting; ash trucks loaded from hoppers; mechanical drying and stoking; 4 motor driven hammer mills shred refuse; 4 furnaces, 2 oil burners ea furnace n excl of land, tin & crane type 2 125-t Nichols Mono hearth units; for refuse, 65% garbage, 35% combustible rubbish o orig cost $1,500 t, alterations $1,242 t; has storage pit p 2 chimneys q $800 t charge-able to sewage plant r not chargeable to refuse s no chimneys, induced-draft, fly ash intercaptor syst, cost incl land, landscaping, engrg, overhead, ventin for garage & refuse pit, 4 circ furnaces, 2 combust chambers, 2 waste heat boilers (60,000 lb steam/hr); elect wk, 58 motors, lighting 3 bldgs, elect heating, access rd & plaza lgtg, 2, 1,000-kw turbo-generators with switch gear, 1 30k-kw diesel generating set t bldg only; burner capacity 112.5 t; chimney & l.bg designed for ult capacity of 225 t; chimney built at contractor's expense due to error in bid u rated on 8-hr basis at 24 t, 8-t light matl, up to 4"x4"x4', 16-t hvy matl 12"x16"x4' v conveyor system w incl land & landscaping, truck laundry, detached wood hog house that chews up 30"x20' logs and delivers them by conveyor to furnace; oil heat; all gases burned and reburned; 2 furnaces; in residential section, glass & brick walls, inside of bldg sealed to prevent escape of odors, controlled ventilation discharged through chimney for odor control; 35% wet garbage 65% combustibles x bidg only y construction in '52

These consulting engineers contributed cost data on incinerators: Russell J. Rice, Metcalf & Eddy, Boston, Mass., Walter L. Leach, Havens and Emerson, New York, N. Y., Henry W. Taylor, New York, N. Y., R. T. Westbrook, Troy, N. Y., J. F. Laboon, Laboon and Bankson, Pittsburgh, Pa.

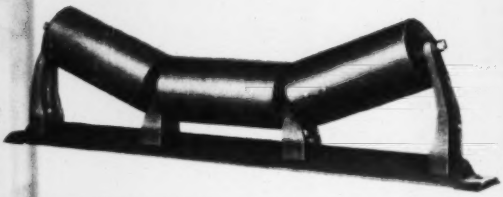
These city and town engineers contributed cost data: W. A. Devine, Brookline, Mass., Ernest Varley, Warren, Ohio, F. E. Young, Cedar Rapids, Ia., Earl H. Stockdon, Staunton, Va., and these officials: J. W. Cone, Comm. of Public Works, Greenwich, Conn., J. B. Atkinson, City Manager, Cambridge, Mass., Louis Fest, Director of Streets, Buffalo, N. Y., and Dept. of Public Works, New Rochelle, N. Y.



Standard and Heavy Duty 3-pulley roller bearing Idlers for belt widths from 14" to 60".

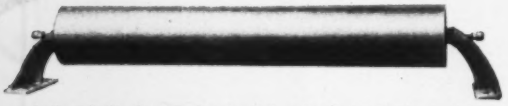


Picking Belt Idlers (with wide center roll) for belt widths from 14" to 60".

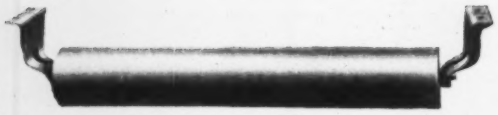


Ball Bearing Belt Idlers for moderate service and belt widths from 14" to 36".

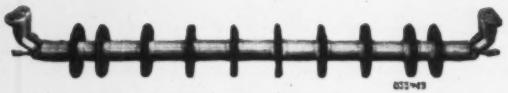
Impact Absorption type Idlers with heavy duty bearings, shafts and shells to withstand shocks and heavy loads. Rubber rolls independent of each other—are renewable.



Ball or Roller Bearing Carrying Idlers for flat belts. Furnished for belt widths from 14" to 60".



Standard Ball or Roller Bearing Return Idlers.



Rubber-covered Spool type Return Idlers. Independent rolls for variable spacing across width of belt—provide cleaning action.

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No doubt about it . . there are defnite reasons why Jeffrey Belt Conveyors get the call on hundreds of projects where large tonnages must be transported great distances quickly and at low cost.

Illustration shows an outstanding Conveyor job, complete with self-propelled Stacker (in foreground). Belts covered to provide protection from the elements. Note small photo (upper-right) showing end of Stacker delivering material to stock pile.

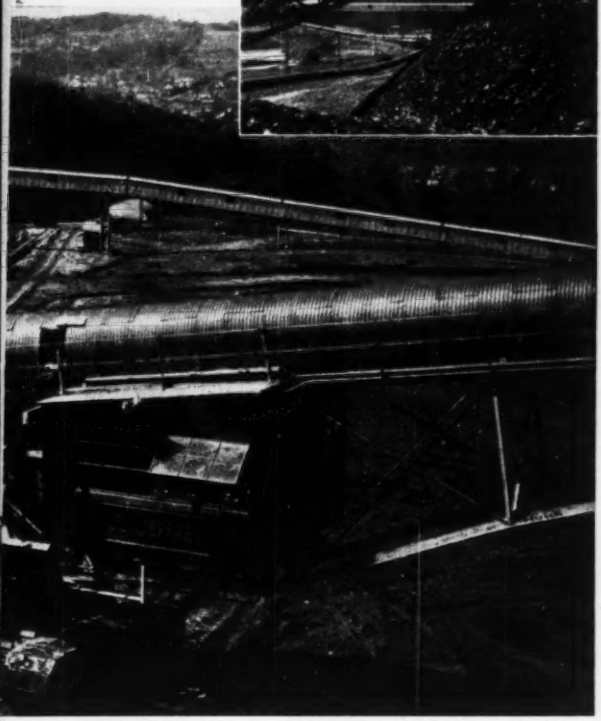
Back of it all is sound engineering and experience. Knowing the right type of Idlers to specify is very important. You see, our engineers are specialists . . know that a Belt Conveyor functions no better than the Idlers upon which the belt carries material.

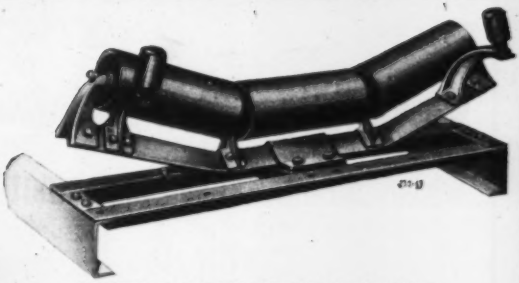
These same engineers are not afraid to suggest innovations in design to better serve your needs. They have made many big scale, and more often ingenious, applications of Belt Conveyors.

Thus, you can be assured of alert, experienced engineering . . the ability to build carefully and to design for contingencies—prompt deliveries. Put them to work for you.

BELT CONVEYORS

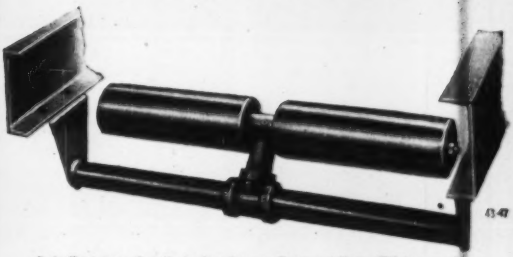
Look again . . note the various types of carrying and return Idlers. A type and size to meet your need exactly. Either ball or roller anti-friction bearings. Sturdily built and designed to provide belt protection—years of operation with minimum maintenance costs.



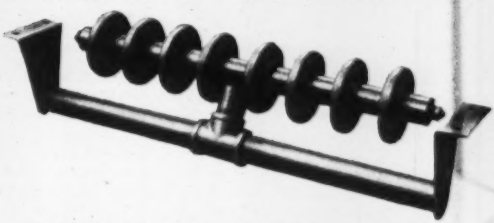


Positive type, pivoted, Belt-Training Carrying Idlers.

Single Roll Belt-Training Return Idlers.



Belt-Training, 2-roll, inclined type Return Idlers. Tilting action of this type Idler makes it very positive in its function.



Spool type, Belt-Training Inclined Belt Idlers. Embody the same principles of operation as the 2-roll type (above) but also provides belt-cleaning action. No build up of material on either spools or belt.

Under each type of Idler shown you will find its description and characteristics. Read them carefully. In addition, Catalog No. 785 is available for more information. It covers our complete line of Belt Conveyors as well as Idlers, Trippers, Pulleys, Take-ups, etc. Send for it today.

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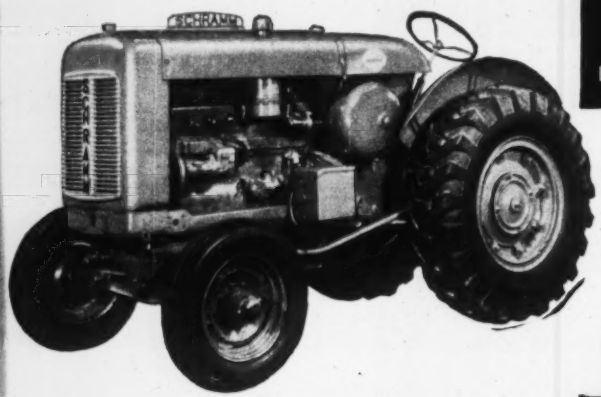
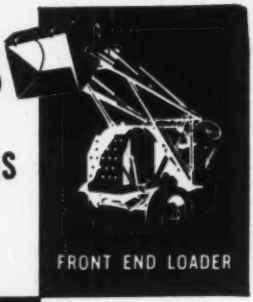


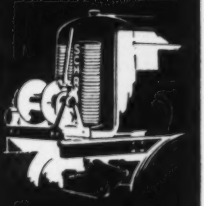


FRONT END LOADER

DRIVING SHEET PILE

DRILLING

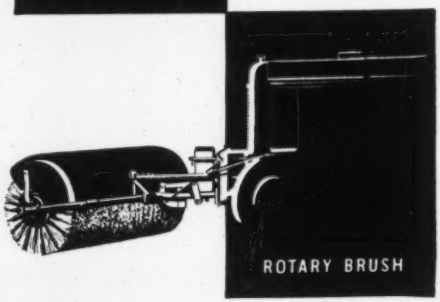
SPRAY PAINTING



FRONT WINCH

CONCRETE BREAKING

EARTH SPADING



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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 6 Massachusetts

Mass., Cambridge—B.A. 11/7—City Water Dpt., 795 Mass. Ave., 1 story, brick general maintenance plant, incl. garages and shops. $300,000. Plans depost $30, refundable. CD 9/7.

† Conn., New London—OIL TANKS—B.A. 11/8—Pub. Wks. Office, Third Naval Dist., 90 Church St., New York, 7, N. Y., relocation fuel oil tanks, U. S. Navy Underwater Sound Laboratory at Fort Trumbull, NOY 70285, Spec. 31872. Plans deposit $10.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MAINE—State Hy. Dpt., State House, Augusta.
The Bridge Constr. Corp., Augusta, Me. LB $233,787. bit. macad. road 2.985 mi. F. A. Secondary Proj. S 0298 (1), Cherryfield.
Farrin Bros. & Smith, Brighton, Me., LB $156,009. bit. macad. road 1.884 mi., F.A. Proj. F 033-1 (1), H-3, Madison. Bids Oct. 17. CD 10/10.

▲† Consolidated Constructors, Inc., 807 Congress St., Portland, Me. CA $1,500,000. 100-bed HOSPITAL Limestone Air Force Base, LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 10/9, under LB.

MASSACHUSETTS—Commonwealth of Mass., Dpt. Pub. Wks., 100 Nashua St., Boston.

Hill Constr. Co., Providence St., Millbury, Mass. LB $83,930, est. $100,000 state hy. reconstr., Grafton. Bids Oct. 16. CD 10/2.

BUILDINGS

LOW BIDS AND CONTRACTS

Bridau Constr. Co., Inc., Exchange St., Berlin, N. H. CA. Approx. $500,000. pyrrhotipe PLANT, BERLIN, N. H. Brown Co., 650 Main St., Berlin, N. H. The Dorr Co., Barry Pl., Stamford, Conn., engr. CD 5/26/44.

A. F. Smiley Constr. Co., 115 Trenton St., Pawtucket, R. I., LB. Approx. $500,000. PLANT, Industrial Park, WARWICK, R. I. Hammel Dahl Co., 243 Richmond St., Providence, R. I. CD 9/21.

P. J. Kennedy Co., 10 Division St., Holyoke, Mass. CA $600,000 MANUFACTURING BLDG., ATHOL, MASS. Union Twist Drill Co., 1934 Weloy St., Athol, Mass. Certificate of Necessity Granted.

▲ F. Leroy Fox, 88 Broad St., Boston, Mass. CA $1,000,000. Rubber reclamation PLANT, CAMBRIDGE, MASS. Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.

Sciaba Co., 86 Shawmut Ave., Boston, Mass. CA $919,800. SCHOOL, Keiser Ave., Ward 7, Holyoke St., LYNN, MASS. City School Dpt., 42 Franklin St., Lynn, Mass. Awarded Oct. 15. CD 10/2.

Sciaba Co., 86 Shawmut Ave., Boston, Mass. CA $942,226. SCHOOL and Gymnasium, Essex St., LYNN, MASS. City School Dpt., 42 Franklin St., Lynn, Mass. CD 10/2, under LB.

E. S. Carlson, Inc., 1694 Main St., Springfield, Mass. CA $300,000. SUPER MARKET and BRANCH BANK, WEST SPRINGFIELD, MASS. Century Holding Corp., 1200 Main St., Springfield, Mass. CD 7/24.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 6 Maryland November 9 Pennsylvania

Md., Hyattsville—B.A. 11/5—At office W. R. Douglas, purch. agt. Washington Suburban Sanitary Comm., 4017 Hamilton St., furnishing, del., 500 W. S. S. C. Standard Manhole Frames and Covers S; 3,000 W. S. S. C. standard manhole steps and 18 W. S. S. C. single square inlet frames and gratings. Inquiry No. 000732; adv. ENR 11/1. CD 10/10/49.

N. Y., Long Beach—B.A. 11/5—At office Maurice J. Fleischman city mgr., City Hall, Contr. 1, general constr., refuse incinerator plant and appurtenances; Contr. II heating, ventilating, vacuum cleaning equip. required Contr. III, plumbing; Contr. IV, electrical work; Contr. V chimney stack. Plans deposit Contr. 1, $10; Contsr. II, III, IV and V $15 each. Kelly & Gruzen, 80 Fifth Ave., New York, Zone 11, archts. CD 10/17.

† N. Y., New York—PARK IMPRVS.—B.A. 11/6—National Park Service, Bedloes Island, New York, Zone 4, paving, grading, site imprvs., in Battery Park. $118,000.

† D. C. Wash.—B.A. 11/7—Potomac River Naval Command, Naval Gun Factory, Wash., D. C., entrance alterations, imprvs. to roadway, new retaining wall, walks, curbs, gutters new brick sentry box at Navy Department Potomac Annex. Plans deposit $10.

† Md., Bethesda—PARKING LOT—B.A. 11/7—Dist. Pub. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., parking lot, incl. sub-grading, paving, curbs and painting parking spaces, NOY 70520. Plans deposit $10. CD 5/27/48, under Public Bldgs.

N. Y., New York—B.A. 11/7—Bd. Water Supply, 120 Wall St., Contr. 357, furnishing, del., installing, testing electric lighting equip. for West Branch and Kensico south effluent chambers and the Kensico comfort stations of the Delaware aqueduct, in towns of Carmel, Putnam Co., and Mount Pleasant, Westchester Co. Plans deposit $5. CD 6/16/44.

† Md., Andrews Air Force Base—READINESS HANGAR—B.A. 11/8—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. readiness hangar, Eng 49-080-52-24-'20). Plans deposit $15. Extended date. CD 10/1.

N. Y., Colonie—B.A. 11/8—Town Bd., Temporary Town Hall on west side of Loudon Rd. between Troy-Shaker Rd. and the Troy-Schenectady Rd.; Sect. 5, general constr. filter plant bldg., grading, walks, roads, etc. or Sect. 5-Alt, general constr. filter plant bldg., fdns. for steel clear water tank, grading, walks, road, etc.; Sect. 5A, clear water well or filtered water storage; Sect. 5B, flocculators or Sect. 5B Alt. flocculator or hydrotreator; Sect. 5C, outside piping at filter plant or 5C Alt., outside piping at filter plant; Sect. 5D, installing pumps, motors and engines or Sect. 5D-Alt, installation of pumps, motors and engines; Sect. 5E, aerator. Plans deposit $25. Kels & Holroyd, 257 Broadway, Troy, consult. engrs., CD 1/18/50.

▲ N. Y., New York—B.A. 11/13—President Manhattan Boro, Municipal Bldg., Zone 7, Contr. 44A, superstructure in South St. and Marginal St. from Coenties Slip to Jackson St., for elevated public highway with ramp. Plans deposit $100.

BIDS ASKED—BUILDINGS

N. J., Wyckoff—SCHOOLS—B.A. 11/5—Bd. Educ., Wyckoff, Abraham Lincoln Elementary School, Mason and Central Aves. $540,000. CD 8/9/50.

N. Y., New York—SCHOOL—B.A. 11/5—Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten. Brooklyn, Zone 1, general constr.; plumbing and drainage; heating and ventilating; electrical and lighting fixtures for P.S. 122, Kingsbridge Rd. between Heath and Bailey Aves., Bronx Boro. Plans deposit $15 general constr., $7 each others. CD 9/10.

▲ Pa., West Reading—PATIENT—B.A. 11/5—Reading Hospital & and Spruce Sts., Reading, patient bldg. $1,600,000. Gilbert Assoc., Inc., 412 Washington St., Reading, engr-archt. CD 2/2/49.

▲ N. Y., Jackson Heights—HIGH SCHOOL—B.A. 11/7—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, Junior High School 145, 34 Ave. between 79 and 80 Sts. $1,970,000. Plans deposit $19. CD 5/20/49.

N. Y., New York—SCHOOL—B.A. 11/7—Supt. School Bldgs., Design and Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general constr.; plumbing and drainage; heating and ventilating; electrical and lighting fixtures for P.S. 112, 229 St. and Schieffelin Ave., Bronx Boro. Plans deposit $15 general const., $7 each others. CD 5/18.

N. Y., New York—HOUSING—B.A. 11/7—New York City Housing Auth., 63 Park Row, Zone 38, general contr.; heating and ventilating; electrical; plumbing; furnishing, installing elevators for Bronxdale Houses Proj. No. NY-5-22, in area bounded generally by Watson Ave., Leland Ave., Bruckner Blvd., Sound View Ave. Bronx Boro. Plans deposit $75, $25 elevators. CD 7/27.

▲ N. Y., New York—SCHOOL—B.A. 11/8—Bd. Educ., 49 Flatbush Ave. exten. Brooklyn, Zone 1, P. S. 127, Purdy and St. Raymond Aves. $1,195,000. Plans deposit $15. CD 2/15/43.

N. Y., Rockaway—SCHOOL—B.A. 11/8—Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten. Brooklyn Zone 1, general constr.; plumbing and drainage; heating and ventilating; electrical and lighting fixtures for P.S. 114 addn., Beach 135 St. and Cranston Ave., Queens Boro. Plans deposit $15 general const., $7 each others. CD 10/15/48.

N. Y., New York, SCHOOL—B.A. 11/9—Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten. Brooklyn Zone 1, general constr.; plumbing and drainage; heating and ventilating; electrical and lighting fixtures for P.S. 35, Serpentine Rd. and Clove Rd., Richmond Boro. Plans deposit $15 general constr., $7 each others.

Md., Sandy Springs—SCHOOL—B.A. 11/15—Montgomery Co. Bd. Educ., Rockville, 2 story, brick Sherwood High School, incl. auditorium and library, $540,000. Plans deposit $50. A. R. Clas & Assoc.,

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Shoreham Bldg. N.W., Wash. 25, D. C., archts. Wm. K. Karsunky, 2011 K St. N.W., Wash., D. C., mech. engr. Otto Vogt, 3159 Central Ave. N.E., Wash., D. C., struct. engr. CD 12/17/45.

▲ **N. J., Irvington**—SCHOOL—B.A. 11/19—Bd. Educ., 1253 Clinton Ave., high school addn., $1,600,000. CD 1/18.

SOON LETS CONTRACT—BUILDINGS

N. J., Princeton—PLANT—Heyden Chemical Corp., 393 Seventh Ave., New York, N. Y., soon lets contract plant Bldg. 1 addn., Penns Neck.

Pa., Morrisville—OFFICE, etc.—U. S. Steel Co., 434 5th Ave., Pittsburgh, soon lets contract office labs and locker rooms, Bldgs. 28-11-29-3-9. Approx. $300,000. Hoffman & Crumpton, Century Bldg., Pittsburgh, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

John Roman, Inc., 189 Montague St., Brooklyn 2, N. Y., LB. $588,470, superstructure for connections to Henry Hudson Parkway, Stage I, at Manhattan Approaches to George Washington Bridge, Contr. G-/B 1s0.002, NEW YORK, N. Y. Port of New York Auth., 111 8th Ave., New York 11, N. Y. Bids Oct. 15. CD 9/27.

▲ **New Jersey**—State Hy. Dpt., State Hy. Office Bldg., Trenton.

The Grandview Constr. Corp., 740 S. Fulton Ave., Mount Vernon, N. Y., CA, $1,606,399, dualization of Route 28 (Sect. 30) from Bethlehem-Union Twp. liner to N. J. Women's Reformatory, 4.294 mi. Fed. Aid. Proj. FI 64 (9) Hunterdon Co. Bids Sept. 25, awarded Oct. 16. CD 10/2, under LB.

D. S. Warfel, 440 N. Prince St., Lancaster, Pa., CA. $625,000. SCIENCE bldgs. addns., alterations, North Museum Bldg., LANCASTER, PA. Franklin & Marshall College, Lancaster, Pa. Bids Oct. 10. CD 10/3.

† **Brotherton Constr. Co.**, 1025 S. 21 St., Harrisburg, Pa., LB. $638,209, ADMINISTRATION bldg. and site preparation, NEW CUMBERLAND, PA. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids Oct. 9. CD 10/3.

Stenton Hills Corp., 6730 Old York Rd., Phila., Pa., Separate Contracts. Approx. $800,000. RESIDENTIAL DEVELOPMENT, Ardleigh St., etc., PHILA. PA.

Armour Excavating, Inc., 7921 Oxford Ave., Phila., Pa., CA $522,043, water mains, Somerton Sect., PHILA., PA. Dpt. P. Wks., City Hall Annex, Phila., Pa., Bids Sept. 25. CD 10/5, under LB.

Buckley & Co., Inc., 1317 S. Juniper St., Phila., Pa., LB. $83,780, intercepting sewer, Palmer St.;

James D. Morrissey, Inc., 9119 Frankford Ave., Phila., Pa., LB. $79,984, sewers, various locations, PHILA., PA. Dpt. P. Wks., City Hall Annex, Phila., Pa. Bids Oct. 11. CD 10/4.

E. Clifford Durell & Son, Inc., 1910 N. Marshall St., Phila., Pa., CA. $117,029, North Phila. Airport, T-hangar imprvs. PHILA., PA. Dpt. P. Wks., City Hall Annex, Phila., Pa., A. Zane Hoffman, c/o owner, ch. engr. CD 10/4/49.

Earl L. Cump, 251 Park Ave., Chambersburg, Pa., CA, $633,004, general constr. BOYS' COTTAGES, Scotland School for veterans children, SCOTLAND, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Sept. 12, awarded Oct. 16. CD 9/18, under LB.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2.

F. P. Asher Jr. & Sons, Inc., West Ext., Annapolis, Md. LB. $559,403. grading, drainage, wid'n., resurf. 6.135 mi. State Rte. 5, Contr. SM 292-1-515, St. Mary's Co. Bids Oct. 9. CD 9/27.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2.

Williams Constr. Co., Box 145, Baltimore, Md., LB $1,919,933. grading, drainage, surf. dual hy. for 5.293 mi. east of Ridgeville, US Rte. 40, Contr. HO 234-3-315, Howard Co.;

T. B. Gatch & Sons, Inc., 5928 Belair Rd., Baltimore, Md. LB $137,720. resurf. 3.9 mi. U.S. Rte 1 nearest of Kingsville, Contr. H 347-415, Harford Co. Bids Oct. 16. CD 10/11.

B & W Contg., Inc., Hamilton Bank Bldg., Baltimore, Md. LB $92,361. Contr. 5184-RX road repairs, TOWSON, MD. Comrs. Baltimore Co., Court House, Towson, Md. J. Fred Offutt, Court House, Towson, Md., road engr.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2.

F. P. Asher Jr. & Sons, Inc., West Ext., Annapolis, Md. CA $559,403. grading, drainage, wid'n. 6.135 mi. State Rte. 5, Contr. SM 292-1-515, St. Mary's Co. CD 10/17, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

North Vale Homes, c/o A. H. Salkowitz, archt., 37-60 82 Ave., Jackson Heights, N. Y., Owner Builds. $750,000. 50 one and two family HOUSES 156 St., north of Horace Harding Blvd., BAYSIDE, N. Y.

Gotham Constr. Corp., 501 Fifth Ave., New York 17, N. Y. LB. $909,500. SCHOOL, P. S. 139 addn., Rugby Rd., north of Cortelyou Rd., BROOKLYN, N. Y. Bd. Educ., 49 Flatbush Ave. exten. Brooklyn 1, N. Y. Bids Oct 16. CD 9/20.

▲ **George F. Driscoll Co. & Moccia Constr. Co.**, 41 E. 42 St., New York 17, N. Y. LB. $1,217,700. SCHOOL, P. S. 200, 164 St. between 71 and Jewell Aves., FOREST HILLS, N. Y. Supt. School Bldgs., Design & Constr., 49 Flatbush Ave. exten., Brooklyn, 1, N. Y. Bids Oct. 19 CD 9/28.

▲ **D. Fortunato, Inc.**, Garfield Ave., Floral Park, N. Y. CA. $1,372,551. 2 SCHOOLS, one at Howell Rd. and

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N. Fletcher Ave., the other at Catalpa Dr. and Willow Ave., VALLEY STREAM, N. Y. Bd. Educ., Union Free School Dist. 13, Valley Stream, N. Y. Bids Aug. 2. CD 7/2e.

A. C. S. Home Builders, Inc., Marne Highway, Hartford, Conn., Separate Contracts, **$804,000,** RESIDENTIAL DEVELOPMENT Browning Rd., PENNSAUKEN, N. J. Edward A. L. Cox, 709 Matket St., Camden, N. J., archts.

Louis Feldsher & Son, 2534 W. Thompson St., Phila., Pa. Separate Contracts, **$570,000,** RESIDENTIAL development, Holly Ave., PITMAN, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

N. A. K. Bugbee Co., 54 Oakland St., Trenton, N. J. CA **$600,000.** 3 and 4 story, 110x200 ft., brick, steel FACTORY, TRENTON, N. J. Columbia Carbon Co., 501 Cass St., Trenton, N. J. Raymond Bowers, 180 Nassau St., Princeton, N. J., archt.

H. K. Ferguson Co., 19 Rector St., New York, N. Y., CA, design and construct HEATING PLANT serving the National Tube Co., Fairless Steel Works, MORRISVILLE, PA. U. S. Steel Co., 434 5th Ave., Pittsburgh, Pa.

Finestone Bros., 514 E. Roosevelt Blvd., Phila., Pa., Separate Contracts. **$700,000.** RESIDENTIAL development, Glendale and Jay Sts., PHILA., PA.

Edward A. Reider, 110 S. 4 St., Reading, Pa., LB. **$524,224.** NURSES HOME addn. READING, PA. St. Joseph's Hospital, 12 and Walnut Sts., Reading, Pa., Bids Sept. 27. CD 9/6.

† **Hadley Contg. & Constr. Co.,** 1213 Wood St., Phila., Pa. CA **$591,461.** 60x300x40 ft., structural steel, cement, concrete, masonry artillery and fire control SHOP incl. two 12x20 ft. wings, 40x50 ft POWER HOUSE, ABERDEEN PROVING GROUND, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. CD 9/28 under LB.

Welsh Homes, Inc., 11 E. Fayette St., Baltimore, Md. Owner Builds. **$567,000.** 81 16x33 ft., masonry row type HOUSES in groups 3900 block Balfern Ave., and 3900 and 4000 blocks Elmora Ave., BALTIMORE, MD.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 14 Louisiana
STREETS AND ROADS
November 14 Louisiana

† **North Carolina**—B.A. 11/6—U. S. Eng., 308 Custom House, Wilmington, maintenance dredging 900,000 cu. yd. Wilmington Harbor, New Hanover Co. CIVENG 31-075-52-6. CD 10/4.

† **Louisiana**—B.A. 11/8—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, approx. 80,000 cu. yd. earthwork on West Atchafalaya Basin Protection, Inv. 52-70, St. Mary Parish. CD 6/26/46.

† **La., Alexandria**—RAILROAD SPUR—B.A. 11/8—U. S. Eng., 300 Broadway, Little Rock, Ark., railroad spur Alexandria Airport, ENG 03-050-52-13.

† **Tenn., Knoxville**—UTILITIES—B.A. 11/8—U. S. Eng., 303 U. S. Court House, Nashville, Zone 1, utilities, sidewalks, roads and drainage at McGhee-Tyson Air Force Base. CD 10/9.

Tenn., Murfreesboro—B.A. 11/8—City, sanitary sewerage imprvs. Approx. $75,000. Plans deposit $25. Wiedeman & Singleton, Box 1878, Atlanta, Ga., engrs. CD 8/22/46.

† **Fla., Eglin Field**—RADAR FACILITY—B.A. 11/9—U. S. Eng., P. O. Box 1169, Mobile, 7, Ala., airport surveilleance radar facility, incl. electric plant, all utilities, roads, and extens. concrete work Eng 11-076-52-27. Plans deposit $10. CD 1/26.

† **La., Alexandria**—MESS IMPRVS.—B. A. 11/9—U. S. Eng., 300 Broadway, Little Rock, Ark., Job No. Alexandria Air Force Base A52-1A, improve standard of existing mess, Alexandria Municipal Airport, Rapides Parish, approx. 5 mi. west of here, Eng. 03-050-52-14.

† **Ga., Savannah**—STORAGE FACILITIES—B.A. 11/11—U. S. Eng., Post Office Bldg., Savannah, Ga., constr. ATO fuel storage facilities at Hunter Air Force Base, Eng 09-133-52-25.

† **Ga., Fort Benning**—RUNWAY MARKINGS, etc.—B. A. 11/12—U. S. Eng., Post Office Bldg., Savannah, runway markings and electric system addns., at Lawson Air Force Base, Eng. 09-133-52-29.

▲ **Ga., Marietta**—B.A. 11/12—Cobb County—Marietta Water Auth., Marietta, raw water pumping station, water treatment plant supply lines and water storage facilities, $2,800,000. Extended date. Merritt & Weiker, 206 Roswell St., engrs. CD 10/8.

La., Ville Platte—B.A. 11/12—Evangeline Parish Police Jury, street paving, drainage imprvs. approx. 115,200 sq. yd. in Road Dist. 6, Plans deposit $25, Pan-American Engineers, 821 Tenth St., Alexandria, engrs. CD 9/24/45.

▲ **Va., Richmond**—B.A. 11/12—Chesterfield Co., Richmond, Falling Creek water sys. $1,000,000. Perrow & Brockenbrough, Sauers Bldg., consult. engrs. CD 9/18.

La., New Orleans—COACH YARD FACILITIES—B.A. 11/13—New Orleans Union Passenger Terminal Comm., 501 S. Saratoga St., north portion of coach yard facilities at Union Passenger Terminal. CD 11/17/49.

La., Ruston—B.A. 11/13—Town, sanitary sewers, pump stations Plans deposit $50, S. V. Applewhite, 424 Millaudon St., New Orleans, engr. CD 1/30/51.

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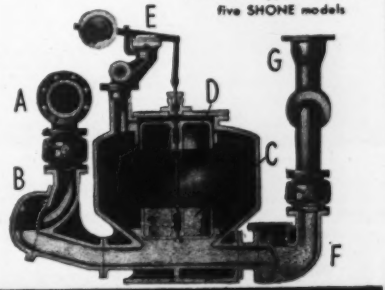

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B Inlet Check Valve
C Lower Bell
D Upper Bell
E Pilot Slide Valve
F Discharge Check Valve
G Discharge Pipe

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† **Miss., Biloxi**—TAXIWAYS, ETC.—B.A. 11/23—U. S. Eng., P. O. Box 1169, 2301 Grant St., Mobile 7, Ala., taxiways, roads, parking areas, walks and utilities at Keesler Air Force Base, Eng. 01-076-52-21. Plans deposit $15. CD 2/7.

BIDS ASKED—BUILDINGS

Ala., Birmingham—CHURCH—B.A. 11/7—Hunter Street Baptist Church c/o Geo. P. Turner archt., American Life Bldg., church. Extended date. CD 10/2.

Ky., Louisville—SCHOOL—B.A. 11/7—Bd. Educ., Fifth and Hill Sts., school to serve West Housing Proj. $850,000. Plans deposit $25, D. X. Murphy & Bros., Louisville Trust Bldg., archts. E. R. Ronald & Assoc., 554 S. Third St., engrs. CD 9/24.

† **W. Va., Natrium**—PLANT—B.A. 11/7—U. S. Eng., 237 Fourth Ave., Huntington, Chemical Corps STB Plant, Serial No. ENG 46-022-52-62. Extended date. CD 10/5.

† **N. C., Fort Bragg**—BUILDING ALTERATIONS, etc.—B.A. About 11/12—U. S. Eng., 308 Customhouse, Wilmington, misc. bldgs. alterations and addns., Part I, provide sprinkler sys. for 3 post engineer warehouses; Part II heavy gun repair shop alteration, Bldg. 493 to provide for instrument repair room; Part III, rehabilitation various station hospital bldgs. incl. providing 2-self contained air-conditioning units, sprinkler sys. for one bldg. and one corridor, painting interior of Red Cross Bldg. and recovering auditorium and lobby floors, etc. Inv. No. Eng 31-075-52-10.

La., Rayne—HOUSING—B.A. 12/1—Rayne Housing Auth., Rayne, 2 public housings. Plans deposit $25. J. H. Gaylord & Co., Sonnier Bldg., Lafayette, archts. CD 12/26/50.

▲ **La., Monroe**—HOUSING—B.A. 12/1—Monroe Housing Auth., 175 housing units for negroes, $1,300,000. CD 10/5/50.

▲ **S. C., Laurens**—HOUSING—B.A. 11/13—Laurens Housing Auth., Laurens, 120 housing units, Projects SC 11-1 and SC 11-2. $1,000,000. John J. Harte Co., 284 Techwood Dr., Atlanta, Ga., archt. CD 9/81.

† **Va., Richmond**—WAREHOUSES—B.A. 11/14—U. S. Eng., foot of Front St., Norfolk, 3 warehouses at Richmond Quartermaster Depot. $500,000. CD 10/10.

SOON LETS CONTRACT—BUILDINGS

Ala., Opelika—MILL—Opelika Mfg. Corp., Opelika, soon lets contract, third addn. to existing mill. Robert & Co. Assocs., 96 Poplar St. N. W., Atlanta, Ga. CD 10/11.

Ga., Atlanta—TERMINAL—Overnite Transportation Co., 220 Houston St. N. E., soon lets contract, truck freight terminal. Approx. $85,000. Plans deposit $15. Greer, Holmquist & Chambers, 402 Stallings Bldg., Birmingham, Ala., archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **J. A. Jones Constr. Co.**, 209 W. 4 St., Charlotte, N. C. CA. $1,101,242. Philpott Power House, Smith River, Philpott Reservoir Proj., Smith River, VIRGINIA. U. S. Eng., foot of Front St., Norfolk, Va. Bids Aug. 29. CD 9/11, under LB.

VIRGINIA—State Hy. Dpt., Richmond.

L. S. Abernathy, Glen Allen, Va., LB. $94,756, wid'n. 0.55 mi. and bridge replacement at Fredericksburg, Rte. 3, Spotsylvania Co.;

A. B. Torrence Co., Inc., Elkton, Md., LB. $82,721, wid'n., straightening 1.36 mi. Route 45, from Farmville north, Cumberland Co.;

Ames & Webb, Inc., 3145 Broad Creek Rd., Norfolk, LB. $103,687, wid'n. to 48 ft. and 50 ft. east of Route 194, Route 168, Norfolk Co.;

Hechler Bros., Inc., Stop 15½ Nine Mile Rd., Richmond, Va., LB. $153,525, 0.53 mi. four-lane divided hy. on Victoria Blvd. west from the Hampton city limits, Route 143, Elizabeth City Co.;

Adams & Tate Const. Co., 2725 Roanoke Ave., Norwich, Roanoke, Va., Lb. $151,078, stabil. base, hard surfaced 6.3 mi. between Maybrook and Eggleston, Secondary Rte. 730, Giles Co.;

Virginia Asphalt Paving Co., Inc., 437 McClanahan St., S. W. Roanoke, Va., LB. $115,731, 2.44 mi. wid'n. to 24 ft. U. S. 460 between Montvale and Villamont, with provision for future four-lane constr., Bedford Co.;

Robert T. Main Co., 1201 Florida St., Salem, Va., LB. $210,797, reconstruct 3.51 mi. U. S. 17 from U. S. 301 east, Caroline Co. Bids Oct. 18. CD 10/8.

▲ **Wannamaker & Wells**, Box 542, Orangeburg, S. C., LB. $434,000, Sect. 3, dam;

Thompson Electric Co., 301 N. Dawson St., Raleigh, LB. $59,571, Sect. 5, electric;

Gilbert Eng. Co., Statesville, N. C., LB. $270,000, Sect. 6, clearing and grubbing;

Blythe Bros. Co., Box 989, Charlotte 1, N. C., LB. $641,688, Sect. 7, water mains;

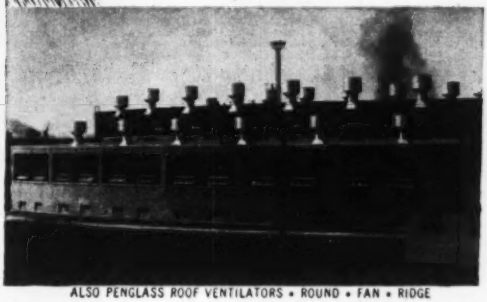
Sanford Constr. Co., Box 427, Sanford, N. C., LB. $35,000, Sect. 8, highway bridges, RALEIGH, N. C. City, W. H. Carper, city mgr., City Hall, Bids Oct. 10. CD 9/28.

MacDougald Constr. Co., Northside Dr., Atlanta, Ga., CA, $272,060 airport improvs at Muscogee County Airport, COLUMBUS, GA. Muscogee Co., Columbus, Ga. Bids Oct. 10. CD 9/18.

† **U. S. Eng.**, Post Office Bldg., Savannah, Ga., cancelled bids to have been opened Nov. 11, ATO fuel storage facilities, at Hunter Air Force Base Eng 09-133-52-25, SAVANNAH, GA. CD 10/5.

(Continued on Page 166)

Daylight ON



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1863 Tenth St., Oakland 20, Calif.

(Continued from page 164)

FLORIDA—State Rd. Dpt., County Court House, Fort Myers,

Scott Constr. Co., Thomasville, Ga., CA, $989,065 2 concrete bridges to replace 3 timber spans on State Rd. 10, Santa Rosa Co. Bids Sept. 14, awarded Oct. 17. CD 9/19, under LB.

▲† Texas Constr. Co., Box 1384, Dallas, Tex. LB $2,348,518, est. $1,950,000. Bayou Boeuf Locks, Inv. 52-22, St. Marys Parish, LOUISIANA...U. S. Eng., Inst. - Prytania St., New Orleans 9, La. Bids Oct. 16. CD 9/5.

LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge,

Forcum-James Co., 1565 Choctaw Dr., Baton Rouge, La. LB $31,423, bit. hot mix over existing pavement, Monroe Sicard Hy., State Rte. 4, S.P. 1-03-09, 2-01-13, Ouachita Parish; LB $81,790, grading, drainage structure, concrete deck girder bridge, 0.825 mi., Larose relocation Hy., State Rte. 78, S.P. 64-05-04, Lafourche Parish.

Barber Bros. Co., 2636 Dougherty Dr., Baton Rouge, La. LB $451,358, soil cement base course 11.088 mi. Krotz Springs Melville Hy., State Rte. 216, S.P. 144-01-04, F. A. Proj. S 172, St. Landry Parish. Bids Oct. 17. CD 10/1, 10/2 and 10/3.

T. L. James & Co., Inc., Ruston, La. LB $575,149, b. conc. pavement together with street drainage, etc. LAFAYETTE, LA. City, Lafayette, La. Bids Oct. 16. CD 10/10.

American Cast Iron Co., 223 E. Elmhurst Rd., Pittsburgh, Pa., LB $46,610, c.i. pipe;

Pittsburgh Des Moines Steel Co., Neville Island, Pittsburgh, Pa., LB $52,900, elevated steel tank, CYNTHIANA, KY. J. Stephen Watkins 251 High St., Lexington, Ky., engr. Bids Sept. 25.

BUILDINGS

LOW BIDS AND CONTRACTS

A. Y. Willard, Windermere Ave., Charleston, S. C. CA. Approx. $300,000. RESIDENTIAL DEVELOPMENT, CHARLESTON, S. C. Stevenson-Zimmerman & Co., c/o contractor.

▲A. R. Briggs Constr. Co., Macon, Ga. CA $1,150,000, PSYCHIATRIC BLDG. for Old People at State Hospital, MILLEDGEVILLE,GA. State Dpt. P. Welfare, State Office Bldg., Atlanta, Ga. Bids Oct. 16. CD 9/27.

Daniel Constr. Co. of Alabama, 822 7 Ave. S., Birmingham, Ala., CA, $885,532, HOSPITAL addn., BIRMINGHAM, ALA. Birmingham Baptist Assn., c/o Lawrence S. Whitten, archt., Brown-Marx Bldg., Birmingham, Ala. Bids Oct. 9. CD 10/15, under LB.

▲ Chris Larsen Co., Maritime Bldg., New Orleans, La. CA $2,055,483. union passenger TERMINAL BLDG., NEW ORLEANS, LA. New Orleans Union Passenger Terminal Comm., 501 S. Saratoga St., New Orleans, La. Bids Oct. 19. CD 9/11.

Chemical Plants Div. of Blaw-Knox Constr. Co., 321 Penn. Ave., Pittsburgh, Pa. CA. cottonseed oil extraction PLANT, incl. engineering design, procurement of materials and equipment, WEST MONROE, LA. Union Oil Mill, Inc., West Monroe, La.

Geo. E. Blandford, Inc., 410 Woodbine St., Louisville, Ky. LB $316,215. heating and ventilating contract for NATURAL SCIENCE BLDG., LOUISVILLE, KY. University of Louisville, 2301 S. 3 St., Louisville, Ky. Bids Oct. 16. CD 9/24.

Al J. Schneider Co., 3720 Seventh St. Rd., Louisville 10, Ky. LB $579,500. 3 story, NATURAL SCIENCE BUILDING, incl. pent house, LOUISVILLE, KY. University of Louisville, 2301 S. 3 St., Louisville, Ky. Bids Oct. 16. CD 9/24.

F. W. Owens Co., 119 N. 5 St., Louisville 1, Ky. CA $964,800. general contract Valley High SCHOOL addn., VALLEY STATION, KY. Jefferson Co., Bd. Educ., 618 W. Jefferson St., Louisville, Ky. CD 10/16, under LB.

John C. Becking, P. O. Box 986, Chattanooga, Tenn., CA. Approx. $100,000. MILL addn., CHATTANOOGA, TENN. Tennessee Paper Mills, North Chattanooga, Tenn.

Foster & Creighton Co., American Natl. Bank Bldg., Nashville, Tenn. CA. Approx. $800,000. FACTORY, Culvert St., NASHVILLE, TENN. Ferro Corp., Harvard and E. 56 Sts., Cleveland 5, O. CD 6/27.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 14 Texas
STREETS AND ROADS
November 14 Texas

Wis., Darlington—B.A. 11/6—Lafayette County Highway Comm., Darlington, constr. Riverside Bridge, Town Road, Contr. 1, Structure B-33-2, Proj. E 0-0 (1).

Mich., Ann Arbor—B. A. 11/7—City, Fred J. Looker, clk., 11,390 ft., sanitary sewer, Pittsfield Valley-Washtenaw Ave. Sewer, 20,726 ft. 10- to 36-in. pipe (80 in. tunnel) CD 11/21/44.

Mich., Lapeer—FIRE PROTECTION—B. A. 11/7—State, A. N. Langius, dir. State Bldg. Dpt., 116 W. Michigan Ave., Y.M.C.A. Bldg., Lansing, fire protection, automatic sprinkler sys. for 9 bldgs., water main connections and dry pipe lines, Lapeer State Home and Training School, Louis C. Kingscott & Assoc., Inc., 511 Monroe St., Kalamazoo, archt. CD 8/25/44, under Public Bldgs.

O., Columbus—B.A. 11/7—Dpt. P. Welfare, J. H. Lamneck, dir. 534 E. Rich St., storm sewer at Columbus State Hospital.

▲ Ind., Indianapolis—B. A. 11/15—Bd. P. Wks., E. A. Gardner, chn., City Hall, main sewer Fall Creek to Temple Ave., first unit, $2,100,000; sewers (extensions E. 34 St. Temple to Forest Manor) incl. 6,970 lin. ft. 48- to 102-in. rein.-con. sewer 613 lin. ft. 42-in. concrete sewer and 1,816 lin. ft., concrete or vitr. sewer pipe, concrete, brick manholes and catchbasins, $556,547, W. R. Hunt, City Hall, Indianapolis, Ind., City engr. CD 9/17 under LB.

BIDS ASKED—BUILDINGS

▲ Ill., Chicago—HOSPITAL—B. A. 11/6—L. A. Weiss Foundation, c/o Loebl, Schlossman & Bennett, archts., 430 N. Michigan Ave., Zone 4, memorial hospital Eastwood and Clarendon Sts. $2,500,000. CD 3/22.

Mich., Detroit—HOSPITAL—B. A. 11/6—City, Dpt. Health, A. R. Pisa, pres., 8 story, 52x217 ft., 52x90 ft. Receiving Hospital addn., Unit D, Contr. BH-19E. Plans deposit $25 refundable. CD 9/9/46.

Mich., Dearborn—SCHOOL—B. A. 11/7—City, James A. Lewis, supt., 2 story, bsmnt., brick, steel Thomas A. Edison Junior High School. Plans deposit $20 refundable, Eberle M. Smith, 153 E. Elizabeth St., Detroit, archt. CD 2/26.

† O., Toledo—SHOP—B.A. 11/8—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., base maintenance shop (2nd phase) Rossford Ordnance Depot, Serial No. ENG 46-022-52-65. CD 10/5.

O., Columbus—POWER PLANT EQUIPMENT—B.A. 11/8—State Dpt. P. Wks., S. O. Linzell, dir., 705 Ohio Dpts. Bldg., power plant equip., repairs and service units (general const.-equip., piping, electrical) at Columbus State Hospital. Plans deposit $5, H. G. Allen, c/o owner, consult. archt. Sims, Cornelius & Schooley, 2901 N. High St., archts.-engrs. CD 11/17/44.

Ind., Decatur—B.A. 11/12—City, H. Vernon Aurand, clk.-treas., Decatur, Contr. 10, generating station bldg. and appurtenant structures for municipal light and power department. $300,000. Plans deposit $10. Emery, Marker & Emery, Toledo Trust Bldg., Toledo, O., engrs. CD 7/14/49.

▲ Ill., Rockford—SCHOOL—B.A. 11/15—Harlem School Dist., 7925 N. 2 St., high school, Harlem, $1,149,540.

† O., Marion—WAREHOUSE—B.A. 11/15—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va., one general purpose warehouse, Marion Engineer Depot, Serial No. ENG 46-022-52-66. CD 10/8.

SOON LETS CONTRACT—BUILDINGS

Ill., Chicago—POWER PLANT—Campbell Soup Co., 2550 W. 35 St., Zone 9, soon lets contract power plant addn. $500,000. Battery & Childs, 231 S. La Salle St., Zone 4, engrs.

▲ Mich., Detroit—PLANT—Nash-Kelvinator Co., 14250 Plymouth Rd., soon lets contract, brick, steel plant addn., Plymouth Rd. $1,000,000, Smith, Hinchman & Grylls, 800 Marquette Bldg., archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

INDIANA—State Hy. Comn., State House Annex, Indianapolis.

G. H. Allen, 804 N. 5 St., Vincennes, Ind., LB, Est. $640,521 rein.-con. bridge over Mill Creek, 0.5 mi. south of Cunot, Owen Co. Bids Oct. 16. CD 10/1.

▲ INDIANA—State Hy. Comn., State House Annex, Indianapolis.

Rieth-Riley Constr. Co., 311 W. Monroe St., Goshen, Ind., LB, $1,017,102, est. $1,165,591; c. conc. 4.649 mi. U.S. 52, Montmorenci to west of Otterbein Rd., Contr. 3416, Tippecanoe and Benton Counties;

McMahan Constr. Co., Rochester, Ind., LB, $76,292, b. conc. wid'n. and resurf. 2.39 mi. U.S. Rd. 36, west of Montezuma, Vermillion Co.;

Calumet Paving Co., Zionsville, Ind., LB, $875,673, est. $1,000,440, c. conc. 7.928 mi. State Rd. 37, Orange to Mitchell, Orleans, Orange and Lawrence Counties;

Ralph Rogers & Co., Inc., S. Adams St., Bloomington, Ind., LB, $155,284, est. $159,538, c. conc. wid'n.

(Continued on Page 169)

"I thought I had all the answers: I knew that chemically treated wood in structural use protects against termites and decay; and lowers the annual upkeep. I knew some preservatives are fire-retardant. I knew that for underwater use—piling for instance— treated wood is essential. I knew all that . . .

BUT HERE'S WHAT I DIDN'T KNOW

I didn't know (till the BAXCO man showed me why) that surface brushing with a wood preservative is not enough—it must be driven deep into the wood cells by pressure treating for long-lasting effect.

I didn't know that BAXCO Pressure Treated wood products will last 3 to 5 times as long as untreated.

I didn't know that BAXCO Pressure Treated wood costs but little more than the untreated. That reduction of annual maintenance expense far more than offsets the added cost of treating.

I didn't know how many types of wood preservatives there are—how they vary in cost, and special qualities—or which to specify for a particular use.

But I'm convinced
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The BAXCO people have had over half a century of experience in preserving wood. They know their business. So, when it comes to pressure-treated wood products, I'm taking the recommendations of the BAXCO man from now on.

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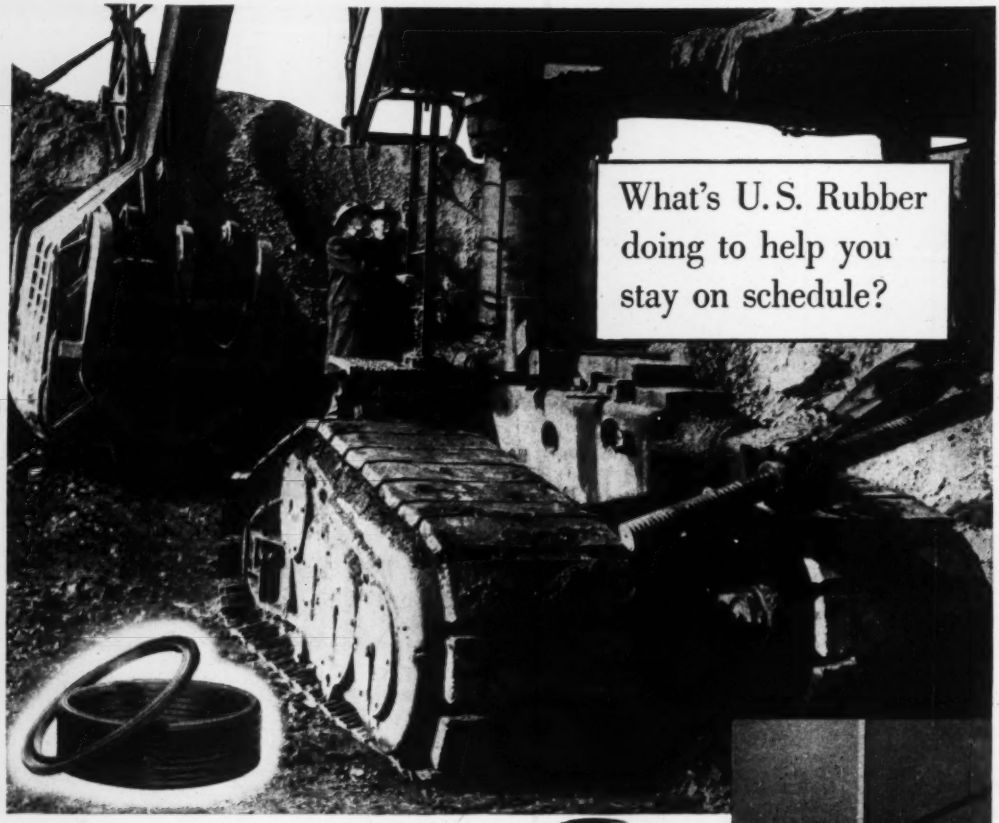

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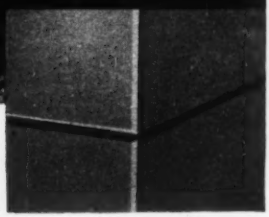

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(Continued from page 167)

4.729 mi. bit. resurf. 5.184 mi. State Rds 67, Switz City to Bloomfield, SR. 54 and 157 in Bloomfield, Greene Co.:

J. C. O'Connor & Sons, Inc., 2104 Miner St., Fort Wayne, Ind., LB, $525,763, est. $531,731, c. conc. wid'n., and b. conc. surf. 13.03 mi. State Rd. 55 Crown Point to U.S. Rd. 30 and State Rds. 8 and 55, Hebron to Crown Point, Lake and Porter Counties. Bids Oct. 16. CD 10/1.

WISCONSIN—State Hy. Comn., Madison,

Wunderlich Bros. Constr. Co., Appleton, Wis., LB $90,949, Contr. 1, Structure B-68-8, the Clintonville-East County Line Road, S. T. Hy. 156, Proj. S 0113 (2) Waupaca Co. Bids Oct. 16. CD 9/26.

Hunzinger Constr. Co., 4577 N. 124 St., Milwaukee, 13, Wis., LB, $200,248, excavation and piling for shop and technical bldg., MILWAUKEE, WIS. Bd. Vocational Education, 1015 N. 6 St., Milwaukee, 3, Wis. Bids Oct. 15.

Bahr Constr. Co., Manitowoc, Wis., CA, $281,154, sewage treatment plant, RICE LAKE, WIS. City, Rice Lake, Wis. Bids Oct. 2. CD 8/29.

MICHIGAN—State Hy. Comn., 22 Townsend St., Lansing, Zone 13.

I. L. Whitehead Co., Sault Ste. Marie, Mich. LB $289,099. est. $300,000, stabilized aggregate 6.734 mi. M-48 and M-129, SS 17-21, C2 (S17 4), (SS 17-4), C3, (S17 4), Chippewa Co.

C. G. Bridges Co., Escanaba, Mich. LB $121,266. est. $100,000, aggregate surf. 2.954 mi. M-123, FH 17-40, Co (FFH 9 B Clas 3), Chippewa Co. Bids Oct. 9. CD 10/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Perro Concrete Constr. Co.**, 203 W. 3 St., Cincinnati, O. CA. Approx. $5,500,000. 720x360 ft., rein.-con., brick steel PLANT, Glendale-Milford Rd., CINCINNATI, O.: Avco Mfg. Corp., Crosley Div., 1329 Arlington St., Cincinnati, O.

▲ **Kenneth Hammond**, 1178 Allen St., Hamilton, O. Owner Builds. $15,000,000. 1,100 HOMES on 300 acre plot at GREENHILLS, O., near western end of Hamilton Co.

▲ **Albert M. Higley Co.**, 2036 E. 22 St., Cleveland, O. CA. Approx. $1,000,000. AUDITORIUM to seat 500 with 36x80 ft. stage, 2 story WORKSHOP, bldg. shaped like a violin case, OBERLIN, O. Oberlin College, Oberlin, O. Wallace K. Harrison, 45 Rockefeler Plaza, New York, N. Y., archt. Awarded Oct. 18. CD 12/16/44.

Henry J. Spieker Co., 1418 Elm St., Toledo, O., CA. $595,000. general constr. 2 story Jewish COMMUNITY CENTER Bldg., 832,000 cu. ft. concrete constr., at Collingwood Ave. and Virginia St., TOLEDO, O. Jewish Community Center, Albert M. Brown, dir., 1900 Linwood Ave., Toledo, O. Bids Sept. 11, awarded Oct. 8. CD 10/8, under LB.

Geo. Bahre Co., 1015 Southeastern Ave., Indianapolis, Ind. CA, $500,000, 1 story, 118x228 ft., brick, rein.-con. FACTORY and OFFICE, INDIANAPOLIS, IND. Continental Optical Co., Thos. Hood, mgr., 1402 N. Capitol Ave., Indianapolis, Ind. Hans Geiger & Assocs., 1739 N. Meridian St., Indianapolis, Ind., structural engr. Awarded Oct. 15.

United Builders, Inc., 412 Glass Block, Marion, Ind., Owner Builds, $400,000, 50 DWELLINGS in northwest MARION-GRANT IND.

Prairie Homes Inc., Ralph Andrew, mgr., Marion, Ind., Owner Builds, $400,000, 50 HOMES MARION, IND.

Tudor Constr. Co., Clinton, Ind., Owner Builds. $350,000, 50 HOMES, MARION, IND.

Thos. L. Hickey, 712 N. Niles St., South Bend, Ind., LB, $359,950, John Adams SCHOOL addn., SOUTH BEND IND. Bd. School Trustees, South Bend, Ind. Bids Oct. 15. CD 10/2.

Ragner Benson, Inc., 4744 W. Rice St., Chicago, 51, Ill., CA, $400,000 OFFICE and WAREHOUSE unit addn. EVANSTON, ILL. American Hospital Supply Co., 2020 Ridge Ave., Evanston, Ill. Victor L. Charn, 4744 W. Rice St., Chicago, 51, Ill., archts. Awarded Oct. 15.

† **Ring Constr. Co.**, 721 Metropolitan Life Bldg., Minneapolis, Minn., LB, $893,550 LAUNDRY BLDG. 48, Veterans Administration Hospital, HINES, ILL. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Oct. 9. CD 8/28.

▲ **Gust K. Newberg**, 2040 N. Ashland Ave., Chicago, 14, Ill., CA, $1,000,000 250,000 sq. ft. spare parts WAREHOUSE, JOLIET, ILL. Caterpillar Corp., River Rd., Joliet, Ill.

Lloyd Builders, Inc., 61 W. Superior St., Chicago, 10, Ill., CA, $525,000 HOMES, KEWAUNEE, ILL. Henry County Housing Auth., c/o Fairview Homes Administration Bldg., Kewaunee, Ill. Bids Sept. 25, awarded Oct. 4. CD 8/24.

Owner, c/o Ralph C. Harris, archt., 53 W. Jackson St., Chicago, 4, Ill., will not construct 30 unit APARTMENT, EVANSTON, ILL. $900,000. Project abandoned. CD 9/28.

Hunzinger Constr. Co., 4572 124 St., Milwaukee, 13, Wis. CA, $200,000, 1 story, 155x185 ft., concrete, brick FACTORY addn., CUDAHY, WIS. Solar Corp., 1000 W. Bruce St., Milwaukee, 4, Wis. Grassold & Johnson, 734 N. Jefferson St., Milwaukee, 2, Wis., archts.

R-W Constr. Co., 4831 W. State St., Milwaukee, 8, Wis. Owner Builds, $160,000, 1 story, 80x200 ft., concrete block steel, STORAGE and OFFICE, MILWAUKEE, WIS. F. J. Hinton, 828 N. Broadway, Milwaukee, 2, Wis., archt.

▲† **O. W. Burke Co.**, 1032 Fisher Bldg., Detroit 2, Mich. CA Est. $30,000,000. J-48 engine MANUFACTURING BLDG. and BOILER HOUSE on 306 acre site, Van Dyke Rd., north of 16 Mile Rd.,

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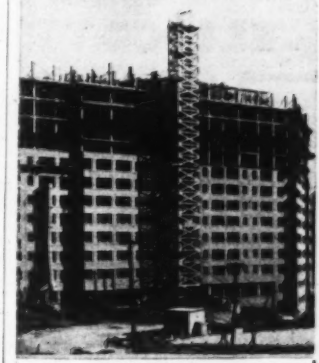

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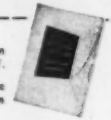

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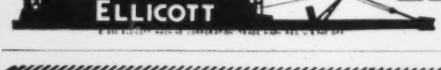

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MaCombe Co., DETROIT, MICH. Dpt. Navy, 18 St. and Constitution Ave. N.W., Wash. 25, D. C. Operated by Chrysler Corp., 341 Massachusetts Ave., Highland Park 3, Mich. CD 9/17.

Luria Engineering Corp., 38 S. Dearborn St., Chicago, Ill. CA $500,000. 1 story, 106 x 500 ft., steel WAREHOUSE, ST. JOSEPH, MICH. Whirlpool Corp., St. Joseph, Mich. CD 6/28.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Arkansas**—B.A. 11/6—U. S. Eng., P.O. Box 60, Vicksburg, Miss., constr. and repair Arkansas River Bank Stabilization Works, between Mile 98 and River Mile 34, incl. Fletcher Bend, Desha Co., Pendleton, Desha Co.; Cummins Bend, Lincoln Co.; Pine Bluff, Jefferson Co.; Hannaberry Lake, Jefferson Co., Little Bayou Meto, Jefferson Co., King's Bayou, Jefferson Co., Serial No. CIVENG 22-052-52-52. CD 12/24/43.

† **Ark., Norfork**—RAILROAD TRACKS—B.A. 11/6—U. S. Eng., 300 Broadway, Little Rock, dismantle and salvage railroad tracks at Norfork Dam site, Eng 03-050-52-12.

Kan., Wichita—RAMP POWER, etc.—B.A. 11/6—Boeing Airplane Co., Plant No. 11, Personnel Bldg., Sect. I, 62 concrete manholes, pull boxes, receptacle and sump pits, 38 metal power receptacle stations, flood light poles, 7,850 lin. ft. 8-way, 1,650 lin. ft. 7-way, 4,270 lin. ft. 4-way 2,140 lin. ft. 2-way and 120 lin. ft. 1-way underground ducts encased in concrete, etc. for Ramp D Power east of Oliver Ave.; high pressure fire protection main, 10,000 lin. ft. 6- to 10-in. Class 150, c.i. pipe line in place, 9.5 tons c.i. fittings, 8 concrete valve manholes, etc. Air Force Plant No. 13, Ramp D, east of Oliver Ave. opposite Plant No. 11. Plans deposit $10 each, Wilson & Co., 223 N. Santa Fe St., Salina, engrs.

† **New Mexico and Texas**—DISCONNECTING SWITCHES—B.A. 11/8—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Willard, one 34,500 volt, 600 ampere, 500,000 kva interrupting rating, outdoor power circuit breaker, and six 46,000 volt, 600 ampere, single pole, single-throw, hook-operated outdoor disconnecting switches for Willard sub-station, Rio Grande Proj. Inv. No. DS 3559.

Tex., Brownsville—B.A. 11/8—City, storm sewers. $75,000. Sigler, Clark & Winston, Weslaco, engrs. CD 12/18/50.

Tex., Brownsville—B.A. 11/8—City, asph. street repaving various streets. $85,000. Sigler, Clark & Winston, Weslaco, engrs. CD 1/8/51.

▲† **Kan., Salina**—PARKING APRON—B.A. 11/9—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., parking apron, incl. clearing, excav. drainage, b. conc. paving hydrants, etc. $3,000,000. CD 9/6.

▲ **Tex., Waco**—COLISEUM—B.A. 11/12—McLennan Co., Court House, Program 1, 250x365 ft. masonry coliseum, $450,000; Program 2, 64x168 ft., 4-H club bldg., 80x120 ft. main agriculture bldg. and auditorium, $475,000; Program 3, four 64x168 ft. agricultural exhibit bldgs., site pavement, entrances, parking areas, water, sewer lines, $575,000. Bid date changed. Zeigler, Houseman & Assoc., 1900 N. St. Paul St., Dallas, engrs. Broad & Nelson, 505 N. Erway St., Dallas, and Harris H. Roberts, 1103 Med. Arts Bldg., engrs. CD 10/19.

† **Tex., Lubbock**—LEAN-TO ON HANGARS—B.A. 11/13—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, lean-to on 3 existing hangars for Reese Air Force Base. $65,000. CD 8/30.

▲ **Tex., Waco**—COLISEUM, etc.—B.A. 11/15—McLennan Co., Court House, Program 1, 250x365 ft., masonry coliseum. $450,000, Program 2, 64x168 ft. 4-H club bldg., 80x120 ft. main agriculture bldg. and auditorium. $475,000; Program 3, four 64x168 ft. each agricultural exhibit bldgs., site pavement entrances, parking areas, water sewer lines, $575,000. Extended date. Broad & Nelson, 505 N. Erway St., Dallas, and Harris Roberts, 1103 Med. Arts Bldg., archts. Zeigler, Housman & Assoc., 1900 N. St. Paul St., Dallas, engrs. CD 10/9.

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† **Colo., Boulder**—B.A. 12/5—Atomic Energy Comn., P.O. Box 5400, Albuquerque, N. M., raw supply line at Rocky Flats Proj,ect, incl. approx. 20,000 lin. ft. various sizes of c.i. pipe from 2- to 12-in. in diam., Spec. No. 292-52-8, $300,000. Austin Co., 1300 Glenarm St., Denver, engr.

▲ **Tex., Houston**—B.A. 12/11—City, City Hall, 900 Brazor St., San Jacinto River Dam 3,160 ft. long, 47 ft. high with earth embankments (domestic water supply) structure only, intake, 72 in. rein.-con. conduits $7,500,000. Plans deposit $25. Ambursen Eng. Corp., M & M Bldg., Houston, engrs. CD 6/9/48.

BIDS ASKED—BUILDINGS

▲† **N. M., Los Alamos**—SHOP—B.A. 11/9—U. S. Atomic Energy Comn., Los Alamos, 240x600 ft. concrete or concrete block Technical Shop, TA-3, Proj. "U" Inv. No. 291-52-3. $2,500,000-$3,000,000. Extended date. CD 7/31.

Tex., San Antonio—HIGH SCHOOL—B.A. 11/14—Harlandale Independent School Dist., W. B. Spivey, pres., W. Huff Ave., 70,000 sq. ft., concrete frame, hollow tile walls, high school, concrete pier and beam fdn. $950,000. Plans deposit $50. Adams & Adams, Box 283, Terrell Hills, archts. W. E. Simpson, 945 Milam Bldg., engr. CD 8/27.

▲† **N. M., Los Alamos**—LABORATORY—B.A. 11/20—U. S. Atomic Energy Comn., Los Alamos, 2 story bsmnt., 58,000 sq. ft. monolithic type, medical research laboratory, air-conditioning, mechanical, ventilation, etc., Inv. No. 291-52-7. $1,700,000-$2,000,000. Plans deposit $50. CD 7/23.

† **Ariz., Kearns Canyon**—B.A. 11/21—Bureau Indian Affairs Dpt. Interior, 19 and C Sts. N.W., Wash., D. C., heating and power plant, at Kearns Canyon, Hopi Indian Agency. Extended date. CD 10/11.

† **Colo., Fort Lyon**—LAUNDRY—B.A. 11/27—Veterans Admin., Munitional Bldg., Wash., 25, D. C. laundry to incl. West Salt Storage Basin 38, Spec. 51214.

▲ **Tex., Houston**—PLANT—Bids Asked—Shell Chemical Corp., Shell Bldg., ethyl cloride plant expansion. $4,000,000. CD 10/11.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Missouri Pacific Railroad Co., 1200 Missouri Pacific Bldg., 13 and Olive Sts., St. Louis 3, Mo., CA Approx. $60,000 1 story, 35x100 ft., concrete, steel unloading dock at 217 Cedar St., ST. LOUIS, MO. Fulton Bag Co., 217 Cedar St., St. Louis 2, Mo. L. R. Bowen, 315 N. 7 St., St. Louis 1, Mo., engr.

† **Lake Charles Electric Co.**, Lake Charles, La., CA, Lot 1 $687,637, Lot 2 $73,000, powerhouse and switchyard for Bull Shoals Dam, Inv. CIVENG 03-050-52-1, ARKANSAS. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids Aug. 21. CD 8/29, under LB.

▲† **Peter Kiewit Sons Co.**, 1024 Omaha Natl. Bank Bldg., Omaha, Neb. and **Morrison-Knudsen Co.**, 319 Broadway, Boise, Idaho, LB $15,339,210, excavation and main embankment, Stage IV, Garrison Dam and Reservoir, Proj. Inv. 52-6, NORTH DAKOTA. U. S. Eng., Fort Lincoln, Box 300, Bismarck, N. D. Bids Oct. 16. CD 9/14.

† **Carrothers Constr. Co.**, Paola, Kan., CA $435,715. water supply sys., to replace present sys. now below pool elevation of Fort Randall Reservoir, Inv. 52-18, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Sept. 20, awarded Oct. 11. CD 8/23.

† **Claussen, Olsen & Benner**, Holdrege, Neb., LB. $774,088, Cambridge Canal Third Sect. of Cambridge Canal Proj. earthwork, structures, Cambridge Canal, Station 1012 plus 52.0 to Station 1549 plus 51.5 and drains, channel changes, Frenchman-Cambridge Div., Missouri River Basin Proj. near Edison, Spec. 3554, NEBRASKA. Bureau Reclamation, Dpt. Interior, Arapahoe, Neb. Bids Oct. 18. CD 10/2.

M. A. Swatek & Co., Hightower Bldg., Oklahoma City 2, Okla. CA. $578,170, est. $672,000. Lake Hefner filter plant extens., OKLAHOMA CITY, OKLA., City, City Hall, Oklahoma City 2, Okla. CD 10/16, under LB.

West Texas Gulf Pipe Line Corp., Gulf Bldg., Houston, Tex. Own Forces. Approx. $670,000. pumping station, Colorado City, TEXAS. CD 10/11.

C. F. Braun & Co., 1000 S. Freemont St., Alhambra, Calif., CA. Approx. $45,000. water sys., HOUSTON, TEX. Ethyl Corp., City Natl. Bank Bldg., Houston, Tex.

Century Constr. Co., 6400 Liberty Rd., Houston, Tex., LB. $279,861, est. $50,000. Contr. 1, water Distr. sys. HOUSTON, TEX. Harris County Fresh Water Supply Dist. 23, Court House, Houston, Tex. Bids Oct. 13. Frank J. Metyko, Scanlan Bldg., Houston, engr.

V. L. Evans & A. E. Bailey, State Natl. Bldg., Houston, Tex., Own Forces. Approx. $55,000. water lines, facilities, HOUSTON, TEX

C. F. Braun & Co., 1000 S. Freemont St., Houston, Tex., CA. Approx. $63,200. design and construct, storm sewers, drainage; Approx. $60,500, sanitary sewers, HOUSTON, TEX. Ethyl Corp., City Natl. Bank Bldg., Houston, Tex. CD 4/26.

English Constr. Co., Box 497, Galena Park, via Houston, Tex., LB. $181,820, est. $75,000. Contr. 5, sanitary sewer collection line unit;

A. C. Koehler, Box 6235, Houston, Tex., LB $84,402, est. $85,000. Contr. 6, sewage treatment plant, HOUSTON, TEX. Harris Co. Fresh Water Supply Dist. 23, Court House, Houston, Tex. Frank J. Metyko, Scanlan Bldg., Houston, Tex., engr. Bids Oct. 13.

V. L. Evans & A. E. Bailey, State Natl. Bldg., Houston, Tex., Own Forces. $66,000. sanitary sewers;

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Approx. $77,250, storm sewers, open drainage, grading, site earthwork, HOUSTON, TEX. CD 8/29.

C. F. Braun & Co., 1000 S. Freemont St., Alhambra, Calif. CA. Approx. $71,000, design and construct street and road constr. hard paving, HOUSTON, TEX. Ethyl Corp., City Natl. Bank Bldg., Houston, Tex.

V. L. Evans & A. E. Bailey, State Natl. Bldg., Houston, Tex., Own Forces. $78,500, street constr. and paving, HOUSTON, TEX.

City, Pasadena, Tex., Own Forces. $75,000, unit of sanitary sewer lines, PASADENA, TEX. A. B. Moore Eng. Co., Box 11, Pasadena, Tex., engr. CD 9/22/48.

City, Pasadena, Tex., Own Forces. Approx. $70,000, street asph. type paving, PASADENA, TEX. George H. Smith, c/o owner, engr. CD 1/9/50.

▲† **T. C. Bateson Constr. Co.**, Irwin Keasler Bldg., Dallas, Tex., LB. $502,425, maintenance hangar; LB. $514,618, est. $1,750,000, maintenance base shops; LB $279,757, est. $500,000, addnl. maintenance and operation facilities, Shepherd Air Force Base, Inv. No. Eng 34-066-52-11, WICHITA FALLS, TEX. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Oct. 16.

MONTANA—State Hy. Comn., Capitol Bldg., Helena.
Peter Kiewit Sons Co., Sheridan, Wyo. CA $537,946, grav. surf., oil 7.748 mi. Wolf Point-North Dakota line road, Roosevelt Co.;

Nilson-Smith Constr. Co., 812 2 St. S., Great Falls, Mont. CA $241,455, grav. surf. 10.276 mi. Great Falls-South Road, Cascade Co. Bids Oct. 11.

BUILDINGS

LOW BIDS AND CONTRACTS

Sauers Constr. Co., 1255 Larpenteur Av. W., St. Paul, Minn. LB $436,000, general constr. HOSPITAL, HASTINGS, MINN. Salve Regina Memorial Hospital, Hastings, Minn. Bids Oct. 11. CD 10/2.

Heymann Constr. Co., New Ulm, Minn. CA, $500,000, general contract 3 story, part bsmnt., 160x203 ft. HIGH SCHOOL, NEW ULM, MINN. Holy Trinity Catholic Parish, Very Rev. V. Schiffrer, pastor, New Ulm, Minn. Bids June 5. CD 6/19.

Geer-Maurer Constr. Co., Grand Island, Neb., LB $572,780 general contract Myrtle Memorial HOSPITAL, HARLAN, IA. Shelby Co., Harlan, Ia. Bids Sept. 12. CD 9/7.

▲ **St. Joseph Lead Co.**, 250 Park Ave., New York 17, N. Y. Separate Contracts. $2,000,000, FLOAT MILL addn., Federal Mill; $5,000,000, lead and zinc MINE PLANT development, Washington Co.; $3,000,000, lead SMELTER and FURNACE, HERCULANEUM, MO. CD 3/28.

▲ **J. E. Dunn Constr. Co.**, 929 Holmes St., Kansas City 6, Mo. LB $1,709,242, twenty-eight 2 story frame BUILDINGS, incl. 232 housing units, Riverview Proj., on North Pasco exten., KANSAS CITY, MO. Kansas City Housing Auth., City Hall, Kansas City 6, Mo. Bids Oct. 10. CD 7/12.

Dickie Constr. Co., Loudermann Bldg., 317 N. 11 St., St. Louis 1, Mo. CA 2 story, 88x131 ft., brick, masonry, rein.-con. FACTORY addn., Second and Mallinckrodt Sts., ST. LOUIS, MO. Mallinckrodt Chemical Works, 3600 N. Second St., St. Louis 7, Mo. Nichols & Norton, 285 Columbus Circle, Boston, Mass., engrs. and archts.

Duenke Constr. Co., 7810 Morganford Rd., St. Louis 23, Mo. Owner Builds. $300,000, thirty 1 story, concrete DWELLINGS, Carondelet Blvd., Adkins and Leona Aves., ST. LOUIS, MO.

Lapham & Hartman Constr. Co., 713 Minnesota Ave., Kansas City, Kan. CA $300,000, truck terminal and office on 6 acre site, 14 and Kansas Aves., KANSAS CITY, KAN. Southwest Freight Lines, Inc., Missouri Ave. and Oak St., Kansas City 6, Mo. Chas. E. Mullin Jr., Bennett Bldg., Kansas City, Kan. archt.

Rose Bros., Alva, Okla., CA. $343,200 est. $300,000, GYMNASIUM at Northwest State Teachers College, ALVA, OKLA., State Bd. Regents, Capitol, Oklahoma City 5, Okla. Bids Oct. 3, awarded Oct. 17. CD 9/26.

Industrial Constr. Co., 1627 W. Main St., Oklahoma City, Okla. CA $818,967, general constr. Charles Curtis Intermediate SCHOOL, WICHITA, KAN. Bd. Educ., Wichita, Kan. Bids Oct. 1. CD 9/25.

▲ **Warren Petroleum Corp.**, Natl. Bank Tulsa Bldg., Tulsa, Okla., Purchase and Hire. Approx. $1,585,570, propane PLANT, Major Co., FAIRVIEW, OKLA. CD 8/6.

E. B. Bush Constr. Co., 3500 W. Reno St., Oklahoma City, Okla., LB. $973,676, electronic test LABORATORY, TULSA, OKLA. Douglas Aircraft Co., 3000 Ocean Park Blvd., Santa Monica, Calif. Bids Oct. 5. CD 10/2.

Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., CA $850,000, design and construct elemental sulphur extraction PLANT, HOUSTON, TEX. Shell Chemical Corp., Shell Bldg., Houston, Tex. CD 10/11.

Pasadena Investment Co., Pasadena, Tex., Owner builds. $645,000, 67 DWELLINGS, PASADENA, TEX. CD 10/10.

H & N T Motor Freight Co., 1207 Providence St., Houston, Tex., cancelled bids, masonry motor FREIGHT TERMINAL, HOUSTON, TEX. $250,000. CD 9/27.

Howard Housing Co., c/o Knollwood Village, Houston, Tex. Owner Builds. Approx. $310,000. HOUSING, HOUSTON, TEX. CD 10/5.

Wallace Brooks, Rockdale, Tex., CA. Approx. $680,000, approx. 85 DWELLINGS, ROCKDALE, TEX. Aluminum Co. of America, 801 Gulf Bldg., Pittsburgh, Pa. CD 8/20.

† **T. C. Bateson Constr. Co.**, Irwin-Keasler Bldg., Dallas, Tex., LB. $623,970, addnl. FACILITIES,

(Continued on page 174)

The Surveyor's Notebook

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"The terrain was heavily wooded; promiscuous cutting was taboo. We ran a series of courses, staying close to the proposed alignment and avoiding as many obstacles as possible. Position of each transit point, with reference to alignment, was computed. Offset shots were taken from the transit points to locate the profile. Frequent checks were made against the photos and the predetermined azimuth was revised to agree. Distances and elevations were determined by stadia.

At Shokan Reservoir, which he helped plan in 1908, Herbert Dibbell levels with his Gurley Transit.

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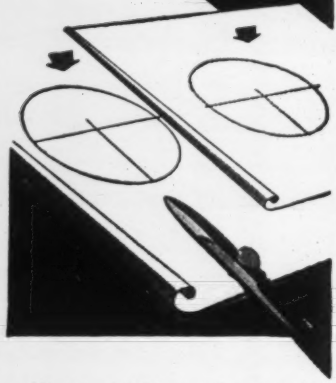

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(Continued from page 172)

Area 1, Lone Star Ordnance, Inv. No. Eng. 34-066-52-9, TEXARKANA, TEX. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Oct. 16. CD 10/1.

Mead & Mount Constr. Co., Railway Exchange Bldg., Denver, Colo., LB $990,000, general contract MUSIC THEATER and ADMINISTRATION BLDG., GREELEY, COLO. Colorado State College of Education, Greeley, Colo. Bids Oct. 5. CD 8/28.

K. L. House Constr. Co., 214 E. Marquette Ave., Albuquerque, N. M., LB $303,750. Baird Memorial Research LABORATORY, ALBUQUERQUE, N. M. Lovelace Foundation, 4800 Gibson Ave., Albuquerque, N. M. Bids Oct. 12. CD 10/11.

† **Claremont Constr. Co.**, 665 E. Foothill Blvd., Los Angeles, Calif., LB $312,994, est. $250,000-$350,000, BUILDINGS and facilities, TA-22, Proj. "D", mostly a laboratory bldg., Inv. No. 291-52-26, LOS ALAMOS, N. M. U. S. Atomic Energy Comn., Los Alamos, N. M. Bids Oct. 9. CD 9/19.

† **Utah-Leavell**, Box 298, Los Alamos, N. M., CA $593,803, construct SERVICE AREA, Inv. No. 291-52-2, LOS ALAMOS, N. M. U. S. Atomic Energy Comn., Contract Div., Los Alamos, N. M. Bids Sept. 18, Awarded Oct. 12. CD 9/28, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 15 Washington

† **Wash., Richland**—B.A. 11/8—General Electric Co., Richland prime contractor to Atomic Energy Comn., for operation of Hanford Works, installing sewer, water and irrigation lines, otherwise imprv. park and playground areas.

† **California**—RADIO EQUIPMENT—B.A. 11/13—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Sacramento, radio equipment for radio relay stations at Mt. Vaca, Turntable Creek Antioch, Delano, Los Banos, at construction sites: transmitter-receiver assemblies for use on boats, Shasta Power plant, on Bass Mountain for Toyon, Central Valley Proj. Spec. DS 3566. L. N. McClellan, Bldg. 53, Denver Federal Center, Denver, Colo., ch. engr.

† **California**—B.A. 11/13—Bureau Reclamation, Dpt. Interior, Building 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Terra Bella, Calif., pumping units for pumping plants for laterals 102.7W, 104.7W and 107.2W, Saucelito Irrigation District, Friant-Kern Canal Distribution System, Central Valley Proj., Spec. DS-3563. L. N. McClellan, ch. engr.

California — SIGNAL SYSTEMS, etc. — B.A. 11/14 — State Hy. Dpt., P. Wks. Bldg., Sacramento, full traffic-actuated signal systems and hy. lighting at intersections of Auburn Boulevard with Fulton Ave. and with Watt Ave., Sacramento Co.

† **California** — SWITCHYARD — B.A. 11/15 — Bureau Reclamation, Dpt. Interior, P. O. Box 570, Tracy, constr. 230-kv switchyard addns., Central Valley Proj., Tracy Switchyard.

† **California** — TRANSFORMERS — B.A. 11/15—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo. furnishing, del. f.o.b. cars shipping point or Roseville, transformers, exchangers, and insulating oil for Folsom Power Plant, Central Valley Proj. Spec. DS-3565. L. N. McClellan, ch. engr.

† **California**—B.A. 11/15—Bureau Reclamation, Dpt. Interior, Bldg., 53, Denver Federal Center, Denver Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Goleta, Calif., hoist frame, screens, lifting beam, guides for Tecolote Tunnel, Cachuma Proj., Spec. DS 3574. L. N. McClellan, ch. engr. CD 4/20/45.

† **Oregon**—TRANSFORMERS—B.A. 11/15—U. S. Eng., Pittock Block, Portland, three 48,000 kva 3-phase power transformers for Lookout Point Dam, Lane Co., CIVENG 35-026-52-89.

BIDS ASKED—BUILDINGS

† **Wash., Auburn**—WAREHOUSES—B.A. 11/8—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, five 1 story, 200x800 ft. masonry, steel warehouses, at Auburn General Depot, ENG 45-108-52-53. Plans deposit $25.

Wash., Bellevue—SCHOOL—B.A. 11/8—School Dist. 405, Bellevue, Clyde Hill School, $500,000. Naramore, Bain & Brady & Johnansen, 9047 Ave., Seattle, Wash., archts. CD 10/3, under LB.

Calif., East Palo Alto—SCHOOL—B.A. 11/9—Ravenswood Elementary School Dist., 523 Donahue St., Palo Alto, Manor Elementary School. Plans deposit $25. Arthur D. Jannsen & Wm. H. Doseking, 1610 El Camino Real, Menlo Park, archts.

† **Calif., Livermore**—BUILDING ALTERATIONS—B.A. 11/13—Veterans Admin., Munitions Bldg., Wash., D. C. Proj. No. 2209, Building No. 1 alterations.

Calif., Berkeley—OFFICE, etc.—B.A. 11/15—State Div. Architecture, P. Wks. Bldg., Sacramento, Calif., caisson foundation and structural steel work for office and laboratory bldg., Dpt. Public Health. Plans deposit $25. CD 1/10/49.

Calif., San Bernardino—SCHOOL—B.A. 11/15—San Bernardino City School Dist., 799 F St., Arrowview

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Junior High School, $300,000. Plans deposit $25. E. Charles Parks, 1582 E. Street, San Bernardino, Calif. archts. CD 3/28/50.

† **Wash., Tacoma**—STORAGE—B.A. 11/15—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, constr. 22,700 sq. ft, addnl. mezzanine storage within Building 8182, Mt. Rainier Ordnance Depot, Eng. 45-108-52-64. Plans deposit $10. J. P. Buehler, dist. engr. CD 7/27.

▲ **Calif., Ventura**—HOSPITAL—B.A. 11/27—Bd. Supervs. Ventura County, Court House, 2 story 104-bed, rein.-con. hospital. $1,000,000. Plans deposit $50. Roy C. Wilson, Box 931 Santa Paula, archt. CD 11/22/50.

SOON LETS CONTRACT—BUILDINGS

Calif., Bellflower—TELEPHONE EXCHANGE—Associated Telephone Co., 1314 7 St., Santa Monica, soon lets contract 1 story, rein.-con. telephone bldg. addn. $300,000. Albert C. Martin & Assocs., 333 S. Beaudry St., Los Angeles, engrs.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WASHINGTON—State Hy. Dpt., Olympia, **P. L. Saddler**, Wenatchee, Wash., CA, $548,970, clearing, draining, grading, surf. 2.68 mi. Hy. 2, Monitor vicinity, Chelan Co. Bids Oct. 9. CD 10/15, under LB.

Valley Constr. Co., 7708 Rainer Ave., Seattle, Wash., CA, $42,856, est. $60,000, water distr. sys. in L. I. D. No. 23 south of SEATTLE, WASH. Water Dist. 20, County-City Bldg., Seattle, 4, Wash. Bids Oct. 16.

▲ **OREGON**—State Hy. Comn., Highway Bldg., Salem, **Berke Bros.**, 7923 N. E. Halsey St., Portland, Ore., CA. $669,982, grading, paving 3.72 mi., Oregon Coast Hy, FAP BF-128 (4), Douglas Co.;

Gibbons & Reed, 259 W. 3 St., Salt Lake City, Utah, CA. $848,815, grading, paving 1.84 mi. Columbia River Hy. FAP BFI-174 (13), Hood River Co.; CA. $1,447,754, grading, paving 3.03 mi., wid'n. Lindsey Creek Bridge, Columbia River Hy., FAP BFI-174 (12), Hood River Co. Grand total $2,966,551. Bids Oct. 11. CD 10/3.

▲† **OREGON**—State Hy. Comn., Highway Bldg., Salem, **Guy F. Atkinson Co.**, Cascade Bldg., Portland, Ore., CA. $1,821,466. grading 6.07 mi., paving 7.23 mi. Columbia River Hy. FAP-FBI-174 (14) Hood River Co.;

R. A. Heintz Constr. Co., 8101 N. E. Union St., Portland, Ore., CA. $689,470. grading 12.4 mi., paving 12.44 mi., 100 ft. concrete road separation the Dalles-California Hy., FAP-BF 120 (2) and FB-126 (2), Klamath Co. Bids Oct. 12, awarded Oct. 18. CD 10/18, under LB.

State Constr. Co., 1750 19 Ave. S., Seattle, Wash., & **Walter McCray**, 308 S. W. 22 St., Mercer Island, Wash. CA. $682,725, Willamette River Crossing, city sewer project, PORTLAND, ORE. City, City Hall, Portland, Ore. Bids Sept. 24, awarded Oct. 17. CD 10/3, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Nelse Mortensen & Co., Inc., 1213 Westlake Ave. N., Seattle, Wash., LB, $478,506, 60 HOUSING Units in frame duplex bldgs. Proj. Wash. 2-2, AUBURN, WASH. Housing Auth. of Kings Co., 2nd and Pine Bldg., Seattle 1, Wash. Bids Oct. 17. CD 10/4.

Brazier Constr. Co., 309 Pontius Ave., Seattle, Wash., LB. $468,837, general contract rein.-con., masonry 60,500 sq. ft. HIGH SCHOOL, BETHEL, WASH. School Dist. 403, Bethel, Wash. Bids Oct. 18. CD 9/26.

▲ **A. V. Petersen**, 2710 N. E. 14 Ave., Portland, Ore., CA concrete work; **Bethlehem Pacific Coast Steel Co.**, Pacific Bldg., Portland, Ore., steel work; **Raymond Concrete Pile Co.**, Equitable, Bldg., Portland, Ore., piling, **Erland & Bickle**, Vancouver, excavation work; for new carbon-baking FURNACE, VANCOUVER, WASH. Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa. Est. over $1,000,000. CD 10/9.

Phoenix Constr. Co., 642 S. Western St., Los Angeles, Calif., Owner Builds, $800,000, 40 frame, stucco DWELLINGS in Mandeville Canyon, LOS ANGELES, CALIF.

Structon, 962 N. La Cienega St., Los Angeles, Calif., CA. $418,778, steel WAREHOUSE, Wilmington, LOS ANGELES, CALIF. City Harbor Dpt. City Hall, Los Angeles, Calif. Bids Sept. 12, awarded Oct. 3. CD 9/19, under LB.

Oberman, 5825 Bewcroft St., Los Angeles, Calif., CA $500,000, two 1 story, reinforced brick MARKETS No. 271 and 273, at ONTARIO and POMONA, CALIF. Bramwell Constr. Co. (Safeway Stores) 58151 S. Broadway, Los Angeles, Calif. Alan P. Polo, 1707 N. Vermont St., Los Angeles, Calif., engr.

Shumaker-Evans, 354 S. Spring St., Los Angeles, Calif., Owner Builds, $570,000, 57 frame, stucco DWELLINGS, POMONA, CALIF. Wm. Bray, 5670 Wilshire Blvd., Los Angeles, archt.

Shumaker-Evans, 354 S. Spring St., Los Angeles, Calif., Owner Builds, $470,000, 57 frame, stucco DWELLINGS, POMONA, CALIF. Wm. Bray, 5670 Wilshire Blvd. Los Angeles, Calif., archt.

E & T Constr. Co., Inc., 601 Crenshaw Blvd., Los Angeles, Calif., CA, $500,000, two 1 story reinforced brick MARKETS No. 265 and 272, REDLANDS and SAN BERNARDINO, CALIF. Bramwell Constr. Co. (Safeway Stores) 5851 S. Broadway, Los Angeles, Calif. Calif. W. M. Bostock, 8414 Otis St., South Gate, Calif., engr. on Bldg. 265; Alan Palo 1707 N. Vermont St., Los Angeles, Calif., engr. on Bldg. 272.

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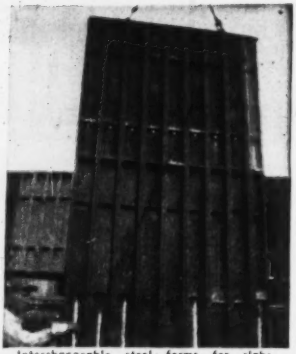

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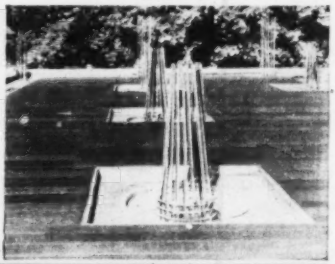

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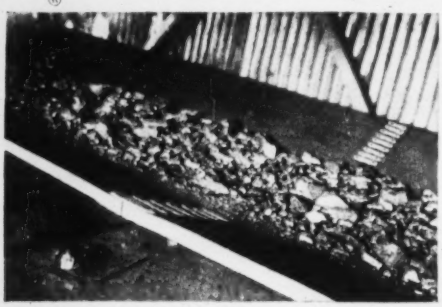

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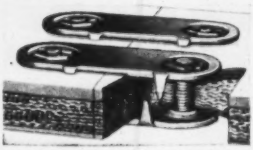

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Cotton Constr. Co., Box 222, Chula Vista, Calif., CA · $136,136, girls shower and locker bldg.;

C. A. Larsen, Box 1208, San Diego, Calif., CA, $189,713 2 story MUSIC BLDG. at Herbert Hoover High School, SAN DIEGO, CALIF. San Diego Unified School Dist., 85 Union St., San Diego, Calif. Bids Oct. 9, awarded Oct. 17. CD 10/16, under LB.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Morrison-Knudsen Co. Inc., 319 Broadway, Boise, Idaho, LB. $214,712, imprv. 3 Ave. and construct drainage facilities, Proj. 50-A-64, KETCHIKAN, ALASKA. Alaska P. Wks. Dpt. Interior, Juneau, Alaska, Bids Oct. 17, CD 10/5.

Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa., LB. $130,966, one step-up outdoor type unit sub-station and one step-down outdoor unit substation at Anchorage, ALASKA. Chugach Electric Assn. Inc., Anchorage, Alaska. Bids Oct. 16. CD 10/4.

U. S. POSSESSIONS

BIDS ASKED—BUILDINGS

Virgin Islands, St. Thomas—HOUSING—B.A. 11/29—Virgin Islands Housing & Redevelopment Auth., Box 68, Charlotte Amalie, St. Thomas, Proj. VI-1-1, thirty 2-story type rein.-con. bldgs. comprising 240 dwelling units, with load bearing clay block walls, incl. utilities and site imprvs., underground cisterns, infiltration gallery and treatment plant. Plans deposit $100. Schimmelpfennig, Ruiz & Gonzales, Monserrate Bldg., Rio Piedras, Puerto Rico, archts.; adv. ENR 11/1.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Barriefield—B.A. 11/6—R. P. Opie, c/o Defence Constr. Ltd., 441 Queen's Quay W., Toronto, 2B, Ont., installing intake for water treatment plant at Army Camp, Job 1696, $150,000. Plans deposit $50. S. M. Connolly, c/o owner, engr.

Ont., Hamilton—B.A. 11/8—City, James F. Berry, clk., City Hall, 30- to 72-in. storm sewers in various streets in three contracts. W. L. McFaul, city engr. CD 6/21/45.

▲ Ont., Toronto—SUBWAY—B.A. 11/27—Toronto Transportation Comn., 35 Yonge St., Sect. 6, last section of Yonge St. subway from Imperial St. to Eglinton Ave. open cut and cut-over combined terminal bldgs. DeLeuw, Cather & Co., 150 N Wacker Dr., Chicago, Ill., U.S.A., and Norman D. Wilson, 388 Yonge St., Toronto, Ont., archts. Mathers & Haldenby, 15 St. Mary St. and John B. Parkin Assocs., 717 Church Sts., engrs. CD 10/6/43.

BIDS ASKED—BUILDINGS

Ont., Toronto—FACTORY, etc.—B.A. 11/7—Westeel Products Ltd., 28 Atlantic Ave., 2 story, 145x246 ft., steel, brick, concrete factory and office bldg., Atlantic Ave. $700,000. Shore & Moffatt, 79 Queen St., E., archts.

Ont., Kemptville—SCHOOL—B.A. 11/9—Dpt. P. Wks., Parliament Bldgs., Toronto, engineering bldg. at Agricultural School at Kemptville. Plans deposit $25. G. N. William, ch. archt. and deputy minister.

Ont., Oshawa—MUNICIPAL—B.A. 11/8—City, F. E. Hare, clk., Oshawa, 6 story, 33x100 ft., rein.-con. municipal bldg. and 2 story, 100 ft. wing, separate council chamber unit, $400,000. Hanks & Irwin, 37 Prince St., Oshawa, Ont., archts. CD 9/29/50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Piggott Constr. Alberta Ltd., 9914-103 Ave., Edmonton, Alta., and Banister Constr. Co., 609 Northern Hardware Bldg., Edmonton, Alta., CA, $250,000, 42 mi. 8 inch pipe line from Wizar Lake oil field to refinery at Edmonton ALBERTA. Texaco Petroleum Products, 10503 107 St., Edmonton, Alta. Awarded Oct. 17. CD 10/4.

Dominion Bridge Co. Ltd., 803 24 Ave. S.E., Calgary, Alta., LB. Approx. $850,000, street and railway overpasses on 4 St. W and 9 Ave. CALGARY, ALTA. City, Civic Bldg. Calgary, Alta. CD 10/2.

BRITISH COLUMBIA—Province of B.C. Douglas Bldg., Victoria.

Active Constr. Ltd., 3213 Cambie St., Vancouver, B.C. LB, $228,368, 5.58 mi. highway between Victoria and Patricia Bay. Bids Oct. 16.

Gilley Bros. Ltd., 902 Columbia St., New Westminister, B. C., LB, $310,000, imprvs. Stevenson North Jerry on Fraser River, STEVENSON, B. C. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Oct. 17. CD 9/26.

W. B. Sullivan Constr. Ltd., 30 Bloor St. W., Toronto, Ont., CA, Approx. $700,000, BARRACK BLOCK No. 3 (250-man) at R.C.A.F. Station, CAMP BORDEN, ONT. Defence Constr. Ltd., 441 Queen's Quay W., Toronto, Ont. S. M. Connolly, c/o owner, engr.

D. W. O'Connoll, 21 John St., Eastview, Ont., CA, $63,550 sprinkler system at R.C.M.P. Barracks, ROCKCLIFFE, ONT. Govt. of Canada, Dpt. Justice, Ottawa, Ont.

(Continued on page 178)

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Shovel reach below ground surface	8 feet
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Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

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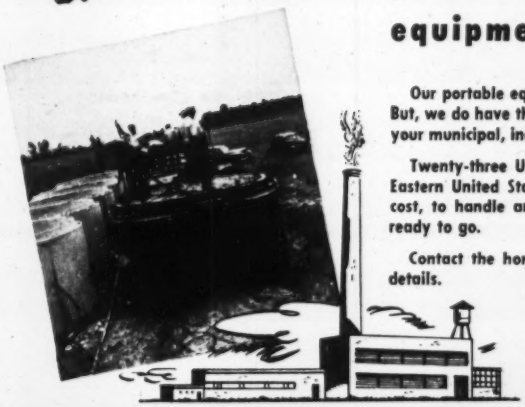

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(Continued from page 176)

▲ **Foundation Co. of Canada Ltd.**, 1220 Bay St., Toronto, Ont. CA, $4,000,000, eleven stations on Yonge St. Rapid Transit Subway, all painting, plumbing, draining, electrical ventilating and pumping facilities, TORONTO, ONT. Toronto Transportation Comr., 35 Yonge St., Toronto, Ont. Awarded Oct. 18. CD 8/13.

Kelly Constr. Co. Ltd., 36 Fenwick Ave., Montreal, Que., CA, $57,942, est. $100,000, concrete dam, 25,815 ft. 6 and 8 in. pipe, domestic services, CARLETON SUR MER, QUE. Muncipality, Carleton Sur Mer, Que. Bids Oct. 10.

C. Gagon, 14 Blvd. Bernard, Drummondville, Que., CA, $125,000, drainage of Salvaille River, ST HYACINTHE, QUE. Province of Quebec, Dpt. Agriculture, Quebec City, Que. A. Dube, Dpt. Agriculture, Quebec City, Que., engr.

Alphonse Roy, 227 DeSalibury St., St. Johns, Que., CA $85,000, baseball stadium, ST. JOHNS, QUE. Municipality, St. Johns, Que. R & G. Charbonneau, 6260 Cote des Neiges Rd., Montreal, Que., archt.

BUILDINGS

LOW BIDS AND CONTRACTS

Christensen & MacDonald, Tegler Bldg., Edmonton, Alta., CA, $795,000, St. Joseph's High SCHOOL addns., 109 St. and 108 Ave., EDMONTON, ALTA. Separate School Bd., A. A. O'Brien, secy., Edmonton, Alta. Bids June 6. CD 5/23.

Armstrong & Montieth Constr. Co. Ltd., 1449 Hornby St. Vancouver, B.C., CA, $260,931, PLANT extens., VANCOUVER, B.C. Canada Roof Products Ltd., 10 and Arbutus St. Vancouver, B.C. A.C. Smith, 400 Blk Granville St., Vancouver, B.C., engr. Awarded Oct. 15.

Baynes Manning Ltd., 1010 Seymour St., Vancouver, B. C., CA $637,167, Junior-Senior High SCHOOL, RICHMOND, B. C. School District 38, 375 Sexsmith Rd., Lulu Island, Vancouver, B. C. Bids Oct. 1, awarded 10/12. CD 10/15, under LB.

A. H. Ward Constr. Co. Ltd., Aldershot, Ont. Owner Builds $600,000, 60 HOMES at Nelson Garden's site, Edinburgh Dr., BURLINGTON, ONT.

Fraser-Brace Engineering Co. (Ontario) Ltd., 80 Richmond St. W., Toronto, Ont., PLANT UNIT to remove fumes from smelter and convert to liquid sulphur dioxide for newsprint making, COPPER CLIFF, ONT. International Nickel Co. of Canada Ltd., Sudbury, Ont. and Canadian Industries Ltd., 1135 Beaver Hall Hill, Montreal, Que. Awarded Oct. 15. CD 5/20/48.

Mac Constr. Co., Wallaceburg, Ont., CA, $400,000, high SCHOOL, DRESDEN, ONT. Lambton-Kent High School, W. Lindsay, Florence, Ont. C. H. Gillin, 284 Dundas St., London, Ont., archt. (Correction—contractor.) CD 9/19, under CA.

W. C. Brennan Contg. Co. Ltd., 400 Gage Ave. N., Hamilton, Ont., CA, $320,000, 1 story, L-shaped, brick concrete SCHOOL, Stewart St., OAKVILLE, ONT. Bd. Educ., Municipal Offices, Colborne St., Oakville, Ont. Bids Sept. 6, awarded Oct. 16. CD 8/25.

Doran Constr. Co. Ltd., 5 Concord St., Ottawa, Ont., CA, Approx. $600,000, Newspaper PLANT, Evening Citizen, Queen and O'Connor Sts., OTTAWA, ONT. The Southam Co. Ltd., Queen St., Ottawa, Ont. CD 12/26.

Jackson-Levis Co., Ltd., 80 King St. W., Toronto, Ont., CA $600,000, 6 story, bsmnt., penthouse, rein.-con., frame, brick U-shaped NURSES RESIDENCE Wellesley Pl., TORONTO, ONT. Toronto General Hospital, 101 College St., Toronto, Ont., CD 10/5.

▲ **Redfern Constr. Co., Ltd.**, 88 Laird Dr., Toronto, Ont., CA, Approx. $2,950,000, 10 story bsmnt. 123x135 ft., rein.-con., steel POSTAL STATION "Q", St. Clair and Yonge Sts., TORONTO, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. G. Brualt, c/o owner, archt. J. H. Hooner, 880 Bay St., Toronto, Ont., engr.

Sinclair-Ferguson Ltd., 1055 Eglinton Ave. W., Toronto, Ont., CA, $400,000, 1 story FACTORY with two story central section 65,000 sq. ft., steel, brick, Lawrence Ave. W. near Dufferin St., TORONTO, ONT. Phoenix Engineered Products Ltd., Lake Shore Rd., Long Branch, Ont. Awarded Oct. 18. CD 8/31.

Ain & Zakuta Ltd., 6910 Wiseman Ave., Montreal, Que., CA, Approx. $450,000, APARTMENT, Cote St. Luc Rd. corner Bonavista Ave., MONTREAL, QUE. J. Aberman, c/o Maxwell M. Kalman, archt., 1200 St. Alexander St., Montreal, Que.

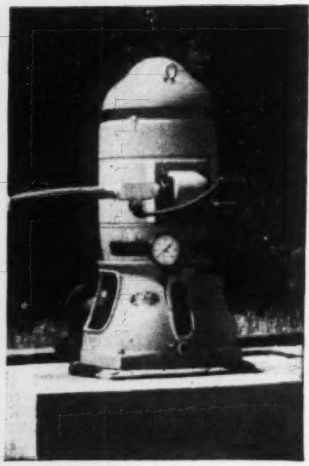
▲ **J. L. E. Price Co. Ltd.**, 680 W. Sherbrooke St., Montreal, Que. CA, $1,700,000, 8 story 72x180 ft., rein.-con., structural steel, brick stone HOSPITAL addn., MONTREAL, QUE. Royal Edward Hospital Bd., 7 St. Urbain St., Montreal, Que. Bids Sept. 5. CD 8/14.

▲ **Shawinigan Engineering Co. Ltd.**, 600 Dorchester St. W., Montreal, Que., CA, Approx. $1,000,000, PLANT EXTEN., SHAWINIGAN FALLS, QUE. Canadian Resins & Chemicals Ltd., Transmission Ave., Shawinigan Falls, Que.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Ga., Decatur**—De Kalb Co., WW Imprvs. $1,000,000. Robert & Co. Assocs., 96 Poplar St. N.W., Atlanta, consult. engrs.



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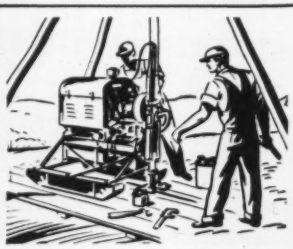

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La., **New Roads**—Town, $550,000 bond election Nov. 13. WW plant and sys., sewer plant and sys., electric plant and sys.

Miss., **Hollandale**—City, voted $450,000 bonds, WW and sanitary sewer imprvs.

▲ O., **Steubenville**—City, WW imprvt. program, $1,876,000. CD 3/12/46.

▲† Pa., **Phila.**—Dpt. Navy, Phila. Naval Base, water treatment facilities. Naval Shipyard, NOY 70169. $1,289,200. Harris-Dechant Assoc., 123 S. Broad St., consult. engrs.

▲ Tex., **Mission**—Hidalgo County Water Dist. 14, Mission, voted bonds, rehabilitation and expansion irrigation project. $1,125,000. CD 10/1.

SEWERS, WASTE DISPOSAL

▲ Ill., **Chicago**—City, City Hall, Chicago, Zone 2 sewer Project 2B, laying sewers in Kilbourn St. between Kinzie and Iowa Sts. and in Iowa St. and in Kostner Ave., $1,848,000. CD 2/8.

▲ Mo., **St. Louis Co.**—St. Louis, c/o Luman F. Matthews, co. superv., Court House, Clayton, Zone 5, 18 mi. sanitary trunk sewers in Coldwater Creek area, $2,380,000, 8 mi. sanitary trunk sewers in Moline Creek area, $1,289,000.

▲ Mo., **Springfield**—City, sewage treatment plant, rehabilitation sewage plant, sewer exten., imprvs., etc. $3,910,000.

N. C., **Salisbury**—City, E. L. Hardin, mayor, Salisbury, bond election Nov. 27, sewer and water sys. imprvs. $800,000. CD 1/16/46.

O., **Warren**—Comrs. Trumbull Co., Court House, bond election November 6, sewage and WW sys. $200,000.

† Pa., **Letterkenny**—Dpt. Army, 24 St. and Maryland Ave., Baltimore, Md., sanitary sewerage sys. facilities, Letterkenny Ordnance Depot. Approx. $150,000. Harris, Dechant & Assoc., 123 S. Broad St., Phila., consult. engrs.

R. I., **Smithfield**—Town, Town Clerks office, Town Hall, treatment plant, East and Greenville Sects. $191,000; sewerage sys. $345,000. Hayden, Harding & Buchanan, 810 Park Square bldg., Boston, Mass., consult. engrs.

▲ Tex., **Beaumont**—City, City Hall, completing sanitary sewer lines and lift stations, $1,750,000. George Schaumberg, American Natl. Bank Bldg., consult. engr. CD 10/20/49.

Tex., **Longview**—City, G. A. McCreight, mayor, WW sys. imprvs., extens. $200,000.

Tex., **Pasadena**—Pasadena Investment Co., Pasadena, sanitary sewer, $75,000; storm sewers, $65,000 in new area Winkler Dr. and Allendale Rd. Johnson Eng. Co., Pasadena, consult. engr.

Va., **Hopewell**—City, bond election Nov. 6, sanitary imprvs. $150,000. CD 8/10/50.

Wash., **McCleary**—City, City Hall, sewage disposal sys. $200,000. CD 11/16/45.

Wis., **Watertown**—City, sewage disposal, $100,000. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, Zone 11, Ill., consult engrs.

BRIDGES

Okla., **Oklahoma City**—City, City Hall, Zone 2, bridge across N. Canadian River at Agnew St. $600,000. H. E. Chase, city engr. CD 1/19.

▲ Tex., **San Antonio**—Bexar Co. Comrs. Court, Court House cancelled bond election Nov. 13, general bridge const., pairing, $400,000; bridge construction Precincts 1, 2, 3, 4, $400,000 each. Russell White, c/o owner, engr. CD 10/15.

▲ WASHINGTON—State, Hy. Dpt., Olympia.

Benton Co.—overpass at Richland "Y", $200,000.

Clark Co.—rein.-con. overcrossing of Hy. 8 on Hy. 1, Vancouver, $225,000.

rein.-con. undercrossing on Hy. 1 at Broadway, Vancouver, $900,000.

Cowlitz Co.—steel bridge over Kalama River on Hy. 1, $300,000.

steel bridge over Coweeman River on Hy. 1, $150,000.

steel bridge over Cowlitz River on Hy. 1, $1,000,000.

Lewis Co.—rein.-con. bridge over La Camas Creek south of Chehalis on Hy. 1, $90,000.

rein.con. undercrossing on Hy. 1 at intersection with Hy. 12-E, $150,000.

rein.-con. bridge on Hy. 1 over Newaukum River, $300,000.

rein.-con. undercrossing on Hy. 1 under Hamilton Rd., $180,000.

rein.-con. Northern Pacific R. R. overcrossing on Hy. 1, in Chehalis, $200,000.

rein.-con. L & W Ry. overcrossing on Hy. 1, in Chehlais, $150,000.

2 rein.-con. bridges over Dillenbaugh Creek on Hy. 1, $200,000.

rein.-con. undercrossing on Hy. 1 at Hy. 12, $90,000.

rein.-con., steel overcrossing at National Ave., Chehalis on Hy. 1, $250,000.

Skagit Co.—rein.-con. undercrossing of Kinkade Ave. on Hy. 1, in Mount Vernon, $125,000.

rein.-con. approach viaduct on Hy. 1, at Mount Vernon, $150,000.

rein.-con. steel overcrossing on Great Northern Ry. tracks to Anacortes on Hy. 1, $300,000. CD 1/29.

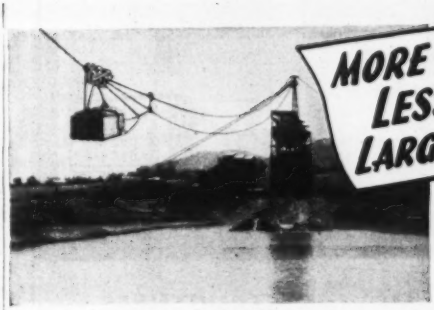
Snohomish Co.—steel bridge over Snohomish River on Hy. 1, $2,000,000.

steel bridge over Union Slough on Hy. 1, $350,000.

steel bridge over Steamboat River on Hy.1, $900,000.

steel, rein.-con. overcrossing on Great Northern Ry. track on Hy. 1, south of Marysville, $600,000.

3 steel span, rein.-con. approach Ebey Slough Bridge on Hy. 1, $1,200,000.



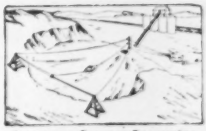
MORE YARDAGE LESS LABOR LARGER PROFITS

Here is a Sauerman Slackline Cableway supplying a screening plant with 225 tons of gravel an hour. Pit is 900' long, 100' deep.

Why it pays to use

SAUERMAN MACHINES

Savings in equipment cost, time, labor and maintenance are four big reasons for using Sauerman Scraper and Cableway machines for all your long range material handling work.

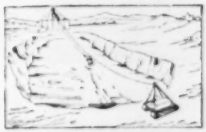


Sauerman Scraper Excavator

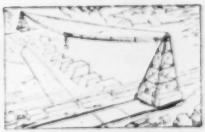
One-man control, fast action, simple and trouble-free. A Sauerman machine reaches across a river, deep down into a pit, up to the top of a hill or across a wide stockpile—moves material from any point within its cable radius, and dumps automatically wherever required.

Sauerman Scraper Stockpiler

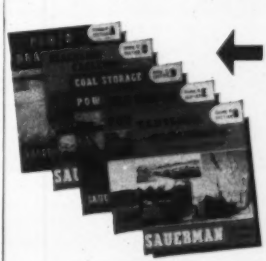
Whether you handle a few tons a day, or many thousand tons, there is a size and type of Sauerman machine suited to your requirements—a machine that gives years of service no matter how tough the job and requires little by way of repairs.



Sauerman Slackline Cableway



Sauerman Tautline Cableway



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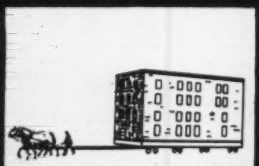

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WATERLOO, IOWA

rein.-con. overcrossing over 4 St., on Hy. 1, Marysville, $150,000.
rein.-con. bridge over Quilceda Creek on Hy. 1, $70,000.
rein.-con. steel undercrossing at Great Northern Ry. tracks on Hy. 1, at Stimson Crossing, $300,000. W. A. Bugge, hy. dir. CD 8/13.

▲ **Nova Scotia**—Dpt. Transport, Hunter Bldg., Ottawa, Ont. stone causeway across Strait of Canso and relocation of railway and highways, navigation locks with 30 foot draft, $23,000,000. O. J. McCullock & Co., 3420 Wilson St., Montreal, Que., consult. engrs. CD 4/28/49.

STREETS AND ROADS

▲ **Ga., Decatur**—De Kalb Co., c/o Chief Comr., County Office Bldg., Atlanta, road imprvs., $1,000,000. Robert & Co. Assocs., 96 Poplar St. N.W., Atlanta, consult. engrs.

Ia., Sibley—Osceola Co., Sibley, county farm to market road imprvs., $128,907.

▲ **Neb., Omaha**—City, City Hall, 18 and Farnam Sts., voted bonds, city arterial highway running northwest through the city, known as Northwest Hy., $2,000,000. Kirkham-Michael & Assoc., 1504 Dodge St., consult. engrs. CD 4/12/51.

N. Y., Allen—Town, 19.95 mi. roads, $139,650.
N. Y., Andover—Town, 25.38 mi. roads, $177,660.
N. Y., Belfast—Town, 20.4 mi. roads, $142,200.
N. Y., Brookfield—Town, 26.2 mi. roads, $323,940.
N. Y., Burns—Town, 14.7 mi. roads, $102,900.
N. Y., Cazenovia—Town 26.2 mi. roads, $191,170.
N. Y., Centerville—Town, 20.1 mi. roads, $140,700.
N. Y., Cuba—Town, 18.5 mi. roads, $124,250.
N. Y., DeRuyter—Town, 15.1 mi. roads, $109,315.
N. Y., Eaton—Town, 29.3 mi. roads, $220,350.
N. Y., Fenner—Town, 20.2 mi. roads, $152,190.
N. Y., Friendship—Town, 21 mi. roads, $147,000.
N. Y., Granger—Town, 17.05 mi. roads, $119,350.
N. Y., Grove—Town, 15.7 mi. roads, $109,900.
N. Y., Hamilton—Town, 21.1 mi. roads, $154,840.
N. Y., Lebanon—Town, 20.3 mi. roads, $150,300.
N. Y., Lincoln—Town, 18.2 mi. roads, $140,290.
N. Y., Madison—Town, 28.2 mi. roads, $213,130.
N. Y., Nelson—Town, 29.8 mi. roads, $218,730.
N. Y., Smithfield—Town, 21.7 mi. roads, $157,790.
N. Y., Stockbridge—Town, 19.9 mi. roads, $145,570.
N. Y., Sullivan—Town, 35.7 mi. roads, $265,200.

Tenn., Maryville—Blount Co., Maryville, replace condemned bridges on Wildwood and Townsend Rds., $250,000.

Tex., Cuero—City, street imprvs., paving, $175,000. Earl Miles, Cuero, consult engr. CD 10/8.

Tex., El Paso—City, voted bonds, street paving, $320,000. CD 7/5.

Tex., Pharr—City, street imprvs. and paving, $235,000. M. B. Gore, Pharr, consult. engr. CD 1/8/51.

▲ **Tex., San Antonio**—Bexar Co., Court House, cancelled bond election Nov. 13, general road imprvs., rehabilitation, surf., Precincts 1, 2, 3, and 4, $2,000,000 each. Russell White, c/o owner, engr. CD 10/15.

▲ **Okla., Oklahoma City**—Oklahoma Co., Court House, Zone 2, addnl. county paved roads, $7,200,000. C. W. McFerron, county engr.

Va., Hopewell—City, bond election Nov. 6, street imprvs., $134,000.

† **WYOMING**—Bureau P. Rds., Dpt. Commerce, Bldg. 22, Denver Federal Center, Denver, Colo.
Wind River—earth graded, drained, and stabilized hy. incl. 2 rein.-con. bridges, Wyomnig Forest Hy. Proj. 2-M.

▲ **Ont., Toronto**—City, City Hall exten.; Keating St. from Leslie St. to Woodbine Ave. at traffic relief along Toronto waterfront, $2,286,790. CD 2/19.

EARTHWORK, WATERWAYS

Tex., Three Rivers—Town, small channel dam, on Frio River to impound 280 acre ft. water annually for domestic useage. $350,000.

AIRPORTS

▲† **Ala., Selma**—STORAGE PLANT—U. S. Eng., P. O. Box 1169, Mobile, Zone 7, plans by Pearson, Tittle & Narrows, First National Bank Bldg., Montgomery, cold storage plant at Craig Air Force Base, $1,322,000. CD 7/18.

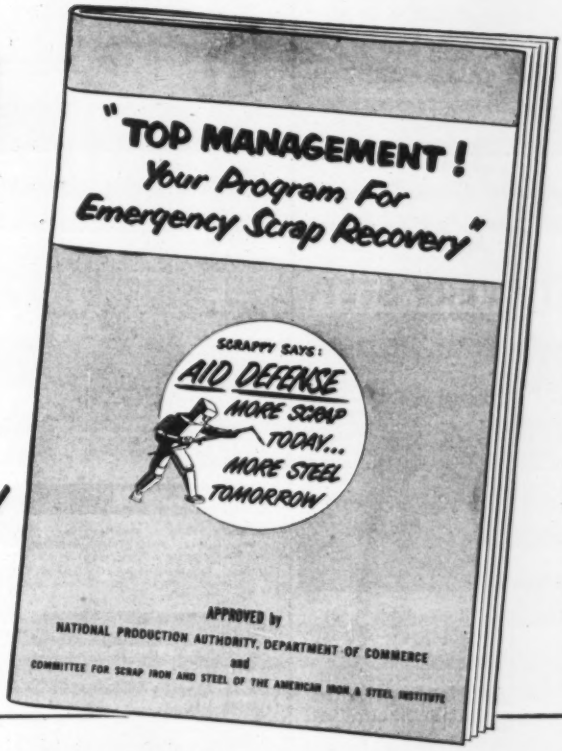
Ky., Louisville—AIRPORT IMPRVS.—Louisville & Jefferson County Air Bd., taxi-strips on west of present air field, $275,956; 1,500 ft. extension to instrument runway, $299,514; completion of taxi strips, $240,299; entrance road and parking facilities, $76,300, all at Sandiford Field (Louisville Municipal Airport).

▲† **Mich., Grosse Ile**—AIRPORT FACILITIES—Dpt. Navy, Bureau Yards & Docks, 18 St. and Constitution Ave. N.W., Wash. 25, D. C., plans by H. E. Beyster & Assoc., Inc., 2000 Industrial Bank Bldg., Detroit, and Victor D. Gruen, 1905 Industrial Bank Bldg.,

(Continued on page 182)

What YOU can do... Must do

to ease the critical iron and steel scrap problem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MORE SCRAP TODAY...
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It's a problem calling for the assistance of every thoughtful business man—now.

Unless the steel mills get more scrap . . . furnaces may have to be shut down.

Shut down—at a time when our armed forces need more and more equipment . . . when civilian demands for steel are greater than ever . . . when our economy is fighting desperately against inflation!

You Can Help. Yes . . . regardless of the business you're in . . . you're in the scrap business, too.

If you're in the steel-fabricating business, you have extra *dormant* scrap to be added to your *production* scrap.

If you're in any other business, you surely have idle metal that will do you—and America—more good being fed into furnaces than cluttering up your premises.

Write for Suggestions. The booklet shown here tells how to set up a Scrap Salvage Program with least amount of effort and minimum interference with your regular operation. It tells where to look for scrap, what to do with it when you get it.

You are urged to send for the booklet now. Use the coupon.

FACTS ABOUT SCRAP SALVAGE

Steel production	1950 — 97,800,000 net tons
Estimated capacity	1952 — 119,500,000 net tons
Purchased scrap used*	1950 — 29,500,000 gross tons
Estimated purchased scrap requirement*	1952 — 36,200,000 gross tons

*All consumers

Where will the extra tonnage come from? Mostly from your *dormant* metal—obsolete machines and structures, tools, jigs, fixtures, gears, wheels, chains, track.

NON FERROUS METAL NEEDED, TOO!

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IRVING SUBWAY GRATING CO., INC.
Long Island City, N. Y.

STANDARD STEEL SPRING CO.
Gary, Indiana

(Continued from page 180)

Detroit, Grosse, Ile Naval Air Station incl. buildings, runway, hangars, jet plans facilities, $3,796,000. CD 6/28.

▲† Mo., Grandview—AIRPORT—Dpt. Army Air Forces, The Pentagon Airline, Wash., D. C., developing Grandview Airport, $12,821,000.

▲ Mo., St. Louis—HANGAR—City, c/o Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, Zone 3, 125x270 ft., rein.-con. maintenance hangar for 4-engine planes shops, office, parking apron at Lambert-St. Louis Municipal Airport, Robertson. $1,200,000. Trans-World Airlines, Inc., c/o Municipal Airport, 10 Richards Rock, Kansas City 6, Mo., lessee. CD 7/14/48.

† N. J., Lakehurst—RAILROAD TRACK SPUR—Dpt. Navy, P. Wks. Office, Phila. Naval Base, Phila., Pa., railroad track spur, Naval Air Station, NOY 70061, $165,000. Black Eng. Co., 259 W. Baltimore Ave., Clifton Heights, Pa., consult. engr. CD 8/13.

▲† N. Y., Sampson—AIR FIELD FACILITIES—Dpt. Air Force, The Pentagon, Wash. 25, D. C., designing of air field facilities, incl. runways, taxiways, motor pool parking, apron sites, admin. and operation bldgs., control tower and gasoline storage, incl. soil investigation. McFarland & Brown Engineers, 503 Press Bldg., Binghamton, consult. engrs. and archts. CD 1/31.

Tex., Brady—HANGAR, etc.—Brady Aviation Co. Inc., Brady, remodeling and expanding some existing airfield and hangar facilities for the mfg. of airplane parts. $250,000.

▲† Tex., El Paso—AIRFIELD IMPRVS.—U. S. Eng., Box 1538, Albuquerque, N. M., plans by Carroll & Daeuble, 1001 E. Yandell St., storage or warehousing, $5,500,000; barracks or housing, $2,500,000; range constr. $350,000; admin. bldg. $400,000; airfield imprvs. $500,000; misc. const. $21,500,000, at Biggs Field. CD 7/6.

LATIN AMERICA

▲ Mexico, Tampico—Municipal Govt. Palacio Municipal, Tampico, plans 10 mi. boulevard, $1,150,000. Angel Aragon, c/o owner, engr.

Mexico, Tampico—Petroleos Mexicanos Juarez, 104, Mexico City, plans oil vessels repair shops. $350,000. CD 1/4/51.

PUBLIC BUILDINGS

Calif., Lafayette—SCHOOL—Lafayette Elementary School Dist., Lafayette, plans by John Lyon Reid, 109 Stevenson St., San Francisco, Lafayette Intermediate School. $400,000.

▲ Calif., Riverside—ADMINISTRATION—Bd. Supervs. Riverside Co., Court House, plans by G. Stanley Wilson, 3681 6 St., 2 story, rein.-con. administration bldg. $1,031,000. CD 9/26/44.

Calif., Willows—SCHOOL—Willows Union Elementary School Dist., Willows, $470,000 bond election Dec. 7, elementary school in northwest section.

▲ Colo., Pueblo—MEDICAL CENTER, etc.—State of Colorado, Colorado State Hospital, Pueblo, medical center and administration bldg., $4,000,000.

Colo., Sterling—HOSPITAL—Good Samaritan Hospital, Sterling, 2 story, full bsmnt. hospital, $600,000. Walter H. Simon, 1922 E. 18 Ave., Denver, Colo., consult. engrs. and archts.

Conn., Branford—HOUSING—Branford Housing Auth., Branford, moderate rental housing, $719,000. CD 5/17/50.

Conn., Killingly—HOUSING—Killingly Housing Auth., Killingly, moderate rental housing, $489,000.

▲ Conn., Manchester—HOUSING—Manchester Housing Auth., Manchester, moderate rental housing, $3,037,000.

Conn., Naugatuck—HOUSING—Naugatuck Housing Auth., Church St., moderate rental housing, $549,000. CD 7/7/50.

Conn., New London—HOUSING—New London Housing Auth., New London, moderate rental housing, $489,000.

▲ Conn., Norwich—SCHOOL—State P. Wks., Commr., State Office Bldg., Hartford, Plans by William J. Provoost, 421 Main St., Stamford, regional vocational school, $1,400,000. CD 10/3.

Conn., Southington—HOUSING—Southington Housing Auth., Southington, moderate rental housing, $587,000.

▲ Conn., Willimantic—SCHOOL—State P. Wks. Comr., State Office Bldg., Hartford, plans by Joseph Della Vale, 153 Court St., New Haven, Regional Vocational School, $1,400,000. CD 10/3.

Del., Claymont—SCHOOL—Claymont Special School Dist. plans by Massena & du Pont, 704 Delaware Ave., Wilmington, school addn. $500,000.

Del., Harrington—SCHOOL—Harrington Del. Special School Dist., plans by Walter Carlson, 1014 Delaware Ave., Wilmington, school and gymnasium addn. $556,745. Bonds voted. CD 11/22/50, under LB.

Del., Newport—SCHOOL—Newport School Dist., plans by G. Morris Whiteside 2nd, du Pont Bldg., Wilmington. Krebs School addn., $636,000.

▲† Fla., Lake City—HOSPITAL—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash., 25, D. C., modernization project for 378-bed Veteran Administration Hospital, $4,400,000.

Ill., Belleville—SCHOOL—Signal Hill School Dist., Belleville, plans by William B. Ittner, 911 Locust St., St. Louis, Mo., school, $500,000.

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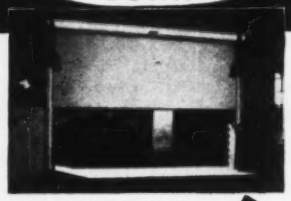

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▲ **La., Gretna**—COURT HOUSE—Jefferson Parish Police Jury, Gretna, plans by Wm. R. Burk Associated Architects & Engineers, 632 Pirates Alley, New Orleans, 8 story, 400x600 ft. court house. $5,000,000. CD 4/26.

▲ **Ind., Terre Haute**—HOSPITAL—Union Hospital Bd. Trustees, 7 St. and 8 Ave., plans by Miller & Vrydagh, 200 Opera House Bldg., 4 story, bsmnt., 100x187 ft., 1 story, 73x140 ft., rein.-con., brick, nurses home addn. and boiler house at hospital. $1,200,000. CD 1/10/44.

Ky., Georgetown—HOSPITAL—Scott County Fiscal Court, Georgetown, plans by Otis & Grimes, Tyler Bldg., Louisville, hospital. $600,000. CD 9/22/40.

La., Bossier City — HOUSING — Housing Auth. City of Bossier City, plans by Jos. H. Gaylord & Co., 722 N. P. Anderson Bldg., Fort Worth, Tex., 70 low-cost housing units. $620,000. CD 8/29.

La., Jennings—SCHOOL—Jefferson Davis Parish School Bd., $600,000 bond election Nov. 13, high school for Dist. 6. CD 6/26/49.

La., Plattenville—SCHOOL—Assumption Parish School Bd., Plattenville, $550,000 bond election Nov. 13, high school, Wm. R. Burk, 632 Pirates Alley, New Orleans archt.

▲ **Md., Crownsville**—ADMISSIONS—State, Dpt. Pub. Imprvts., 506 Park Ave., Baltimore, plans by Jas. R. Edmunds, Jr., 130 W. Hamilton St., Baltimore, 1 story, 300x600 ft., brick admission bldg., heating to connect to central plant, slate roofing, Crownsville State Hospital. $3,500,000. J. F. Faisant & Assoc., 21 W. 25 St., Baltimore, struct. engrs. Jas. Posey & Assoc., 10 E. Pleasant St., Baltimore, mech. engrs., Nathan L. Smith, 506 Park Ave., Baltimore, ch. engr. CD 5/22/44.

Minn., Granite Falls—SCHOOL—Bd. Educ., M. S. Orwell, clk., voted $500,000 bonds Oct. 9, school. Pass & Rockey, Mankato, archts. CD 4/26/51.

Minn., Minneapolis—SCHOOL—Bd. Educ., E. H. Enger, archt.-engr., 807 Broadway NE, school, 57 St. and Emerson Ave. South. $800,000. CD 1/17/45.

▲ **Minn., St. Paul**—HOUSING—St. Paul Housing & Redevelopment Auth., F. Fisher, exec. dir., 1700 Court House, 275 housing units, bounded by Dale and Grotto Sts. and Jessamine and Rose Aves. $3,000,000.

Mass., Uxbridge—SCHOOLS—Town, School Dpt., Capron St., plans by George A. Sidebottom, 200 Haven St., Reading, Junior High School, addn., Mendon St., $350,000; school addn., Oak St., $400,000. CD 10/3.

▲ † **Mo., Overland (St. Louis 14, P.O.)**—RECORDS CENTER—U. S. Eng., P.O. Box 1216, Farm Credit Bldg., 206 S. 19 St., Omaha 1, Neb., 6 story, bsmnt., brick, rein.-conc., steel 1,620,000 sq. ft. Army Adjutant General Records Center, west of Woodson Rd. south of Page Ave., $22,700,000; 1 story, brick, rein.-con., steel, 300,000 sq. ft. building for Army Publications Center, west of Woodson Rd. south of Page Ave., $2,700,000. CD 6/13 under Mo., St. Louis.

Mont., Bozeman—LABORATORY—State Bd. Examiners, Helena, plans by F. F. Willson, Bozeman, Ryan, Engineer Laboratory at Montana State College, $450,000. CD 3/22.

† **N. M., Las Cruces**—TEST—U. S. Eng., 2134 E. Central Ave., Albuquerque, test bldg. Approx. $500,000. Zumwalt & Vinther, Merc. Sec. Bldg., Dallas, Tex. consult. engrs.

N. Y., Flushing—HIGH SCHOOL—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans by Keally & Patterson, 17 E. 49 St., New York, Zone 17, 1 story annex for Newton High School, Main St. and Gravett Rd. $444,400.

N. Y., Plainedge (P.O. Bethpage)—SCHOOL—Common School Dist 18, Town of Oyster Bay, New Schoolhouse, Stewart Ave., Plainedge, grade school. $436,000.

▲ **N. Y., Scarsdale**—SCHOOL—Bd. Educ., Brewster Rd., Heathcote School. $1,350,000.

▲† **Pa., Phila.**—GENERAL SERVICES and SUPPLY OFFICE—Dpt., Navy, Pub. Wks. Office, Phila. Naval Base, plans by Baader, Young & Schultze, 1500 Walnut St., general services and supply office, addnl. facilities, NOY 29162. $2,054,600.

▲† **Pa., Phila.**—LABORATORY—Dpt. Navy, Phila. Naval Base, Phila., plans by Borie & Smith, 1531 Locust St., Naval boiler test laboratory, addnl. facilities, NOY 29166. $5,131,500.

Pa., Springfield—SCHOOL—Springfield Twp. Bd. Educ., Springfield, plans by Harry G. Stewart, 117 S. 17 St., Phila., Senior High School. Approx. $700,000. CD 12/21/50.

Tenn., Jackson—HOSPITAL—Jackson-Madison Hospital, Jackson, 72-bed hospital addn. $600,000.

Tex., Avinger—HOUSING—Avinger Housing Auth., Avinger, plans by Christensen & Christensen, 709 N. St. Paul St., Dallas, 75 low-cost housing units. $575,000. CD 2/28.

Tex., Cooper—HOUSING—Cooper Housing Auth., Cooper, plans by Christensen & Christensen, 709 N. St. Paul St., Dallas, 100 low-cost housing units. $720,000. CD 3/30/50.

Tex., Port Arthur—HOUSING—Port Arthur Housing Auth., Port Arthur, plans by Golemon & Rolfe, 915 Woodrow St., Houston, housing. $475,000. CD 1/31.

Wash., Chehalis—GYMNASIUM, etc.—School Dist. 302, Chehalis, gymnasium and music bldg. for high school $435,000.

▲ **Wash., Seattle**—SUB-STATION—City, County—City Bldg., Seattle, Zone 4, City Light Sub-station in Shoreline District, $2,000,000. E. R. Hoffman, City Light Bldg., city light supt.

▲ **Alaska, Fairbanks**—POWER PLANT, etc.—City, City Hall, increasing capacity of power plant, $1,500,000; extending heating sys. $75,000.

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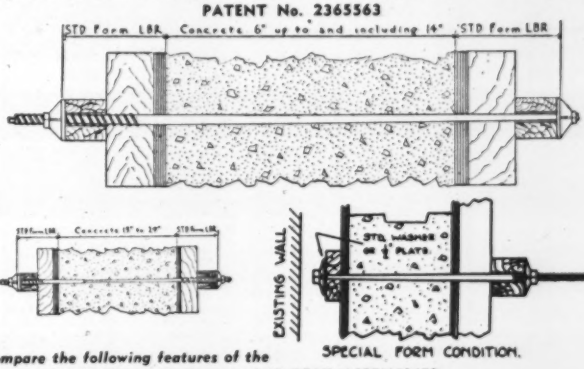

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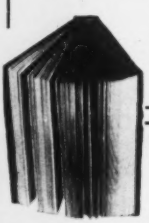

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▲ **Ont., Niagara Falls**—HOSPITAL—Niagara Falls General Hospital Trust, A. S. Robertson, chn., Niagara Falls, ratepayers voting funds, 200-bed hospital extension, $3,000,000. Neergaard, Agnew & Craig, 134 Bloor St. W., Toronto, Ont., consult. engrs. CD 6/16/50.

COMMERCIAL BUILDINGS

▲ **Conn., Westport** — HOUSES — Kowalsky Bros., Post Rd., 1st development 45 houses, $1,125,000; 2nd development, 30 houses, $750,000. Off Richmond Ave. between Easton and Coleyttown Rds. and North Ave.

Ga., Atlanta—HOTEL—O. T. Bell, 155 Ashby St. W.W., hotel, $500,000.

▲ **Ga., Augusta**—HOTEL—E. E. Child Corp., Augusta, hotel, $2,000,000.

Ga., East Point—DRUG STORE—Rexall Drug Co., 505 Whitehall St. S.W., Atlanta, drug store, $535,000.

Ill., Evanston—DORMITORY—Northwestern University, Evanston, plans by Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Zone 1, 4 story girls dormitory, $600,000.

Ind., South Bend—SCHOOL UNITS—South Bend Catholic High School, Rt. Rev. Mgr., Jno S. Sabo, South Bend, plans by Gaul & Co., 228 E. Superior St., Chicago, Ill. two 2 story, bsmnt., High school units, Angela Blvd. and U.S. Rd. 31. $600,000.

▲ **Md., Baltimore**—APARTMENT—Edwin Peters, 3137 Dudley Ave., plans by J. E. Moxley, 1722 Ellamont St., 2 story, bsmnt., 30x190 ft., brick 200 suite garden apartment, $1,500,000.

▲ **N. Y., New York**—OFFICE—Weston Madison Corp., c/o Robert T. Lyons, archt., 363 Lexington Ave. Zone 17. 21 story office bldg., Madison Ave. and 49 St. $1,750,000.

Pa., Phila.—APARTMENT—Nemtol Apartments, c/o Raymond G. Cohlberg, 1411 Walnut St., plans by Aaron Colish, 117 S. 17 St., apartment Approx. $800,000.

▲ **Pa., Phila.**—RESIDENTIAL DEVELOPMENT—Owner, c/o J. T. Jackson Co., Rising Sun Ave. and Roosevelt Blvd., 425 residences, Somerton Ave. $5,100,000.

▲ **Tex., Houston**—DWELLINGS—Pleasantville, Inc., c/o M. A. Silverman, 6205 Almeda Rd., 100 dwellings off 8300 Blk. Market St. Rd. $700,000; 90 addnl. apartment units, off 8400 Blk. Market St. Rd. $400,000.

▲ **Tex., Houston**—DORMITORIES—Texas Southern University, Bd. Trustees, c/o Dr. T. O'Hara Lanier, 3908 Tierwester St., men's dormitory, $650,000; women's dormitory, $500,000; dining hall, $350,000.

▲ **Tex., Mineral Wells**—HOUSING—U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, construct, manage, finance 1,000-unit housing, 200-acre tract at Camp Wolters Air Force Base, $9,000,000. Charles E. Armstrong, Majestic Bldg., Fort Worth, engr.-archt.

▲ **Tex., Pasadena**—SHOPPING CENTER—John A. Campbell & Assoc., 111 W. Southmore St., Houston, masonry shopping center, 15-acre site in Pasadena Oaks. $1,000,000.

▲ **Tex., Pasadena**—SHOPPING CENTER, etc.—Faulkner Building Co., West Bldg., Houston, plans by Knostman & Webster, 2017 W. Gray St., Houston, shopping center, $950,000; 250 frame, masonry dwellings, concrete slab fdn. $2,500,000, both in region Winkler Dr. and Allendale Rd.

▲ **Tex., Pasadena**—DWELLINGS—Pasadena Investment Co., c/o Hill P. White, Pasadena, plans by Knostman & Webster, 2017 W. Gray St., 200 frame type dwellings, concrete slab fdn, region of Winkler Dr. and Allendale Rd. $2,000,000.

▲ **Wash., Longview**—HOSPITAL—Inter-Community Hospital Assn., Longview, plans by Roald, Schmeer & Harrington Spalding Bldg., Portland, Ore., 100-bed hospital, $1,800,000. CD 8/31.

INDUSTRIAL BUILDINGS

▲ **Ark., Little Rock**—SERVICE—Capital Transportation Co., 100 North St., service bldg. for buses, $5,000,000.

▲ **Ga., Atlanta**—WAREHOUSE—Sears, Roebuck & Co., c/o Armistead & Saggus, archts., Candler Bldg., warehouse, $1,250,000.

▲ **Ill., Chester**—PLANT—Colchem Corp., c/o Eberstad & Co., 39 Broadway, New York, N. Y., constr. coal hydrogeneration plant on 38,000 acre tract along Mississippi River adjacent to Chester, Ill., $100,000,000 - $400,000,000. (Correction—name and address of owner). CD 10/8.

▲ **Ind., Elkhart**—SHOPS—New York Central R. R., G. A. Noren, ch. engr., 466 lexington Ave., New York, 17, N. Y., diesel locomotive shops. $2,000,000.

Ind., Kokomo—PLANT—Public Service of Indiana, Plainfield doubling size sub power plant, $500,000 or more.

▲ **Kan., Lawrence**—PLANT—Co-operative Farm Chemicals Assn., c/o Consumers Co-operative Assn., H. A. Cowden, pres., 320 E. 10 St., Kansas City, Mo., nitrogen fertilizer plant, $16,000,000.

Ky., Louisville—GARAGE—Stewart Dry Goods Co., 4th and Walnut Sts., plans by Nevin & Morgan, Starks Bldg., 4 story garage, Third and Guthrie Sts. $850,000, E. R. Ronald & Assoc., 554 S. Third St., consult. engrs.

Mo., Kansas City—FREIGHT TERMINAL, etc.—Pacific Intermountain Express Co., 1401 Independence Ave., Zone 6, plans by William B. Fullerton, Jr., 15 W.

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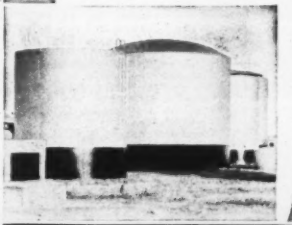

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▲ **N. J. Riverside**—FOUNDRY—Vulcan Mold & Iron Co., Latrobe, Pa., foundry. $1,500,000.

▲ **Pa., Berwyn**—LABORATORY—Burroughs Adding Machine Corp., 511 N. Broad St., Phila., plans by Carroll, Grisdale & Van Alen, 204 W. Rittenhouse Square, Phila., research laboratory, Tredyffrin Twp., Lincoln Hy. and Rte. 202. $2,000,000.

▲ **Pa., Phila.**—REFINERY FACILITIES—Gulf Oil Corp., 30 St. and Penrose Ave., refinery facilities $10,000,000. R. C. Roether c/o owner, ch. engr. CD 1/10/49.

Pa., Phila.—PLANT—U. S. Gypsum Co., 56 St. and Schuylkill Ave., mfg. plant. Approx. $500,000.

▲ **Tex., Dallas**—POWER PLANT—Dallas Power & Light Co., Dallas Power & Light Co. Bldg., 70,000 kw electric generating power plant, near downtown area. $4,000,000.

▲ **Tex., Freeport**—ENGINEERING, etc.—Dow Chemical Co., Commerce Bldg., Houston, plans by MacKie & Kamrath, 2713 Ferndale St., Houston, 68,000 sq. ft. engineering, $884,000; 53,000 sq. ft. administrative, $689,000; 34,000 sq. ft. central cafeteria, $375,000. CD 2/3/47.

Tex., Rockdale—SUB-STATION—Texas Power & Light Co., Interurban Bldg., Dallas, electric generating substation for interchange of power with T.P.&L's Company own system at Sandow, 8 mi. southwest. $750,000.

▲ **Tex., Sundown**—PLANT—Stanolind Oil & Gas Co. & Assoc., Fair Bldg., Fort Worth, sulphur recovery processing refinery plant unit near here. $1,250,000.

▲ **Tex., Texas City**—PLANT—Texas City Chemicals, Inc., Texas City, 2nd addnl. chemical plant unit. $3,500,000.

▲ **B. C., Kimberly**—PLANT EXPANSION—Consolidated Mining & Smelting Co. of Canada Ltd., Trail, B. C. general plant expansion. $64,000,000.

▲ **Newfoundland, Corner Brook**—PLANT EXPANSION—Bowaters Newfoundland Pulp & Paper Mills Ltd., Corner Brook, plant expansion, mills, offices, wing to company hotel, diesel electric generating plant $10,000,000. Nenninger & Chenevert, 1400 St. Catherine St., West, Montreal, Que., surveyors. CD 10/1.

Ont., Hamilton—SUB-STATION—Steel Co. of Canada Ltd., 7 Wilcox St., plans by A. G. McKee & Co., 2300 Chester St., Cleveland, O., U. S. A., 3 electric sub-stations, mould bldg., stock bin bldg., and stripper bldg., Approx. $500,000. Alex Leischman, c/o owner, engr.

Ont., Orillia—PLANT—Fahralloy Canada Ltd., 95 Barrie Rd., 20,000 sq. ft., plant exten. with new cleaning room, $600,000. CD 2/13/45.

▲ **Ont., Toronto**—PLANT—Associated Quarries & Constr. Ltd., 2700 Dufferin St., plant in Scarborough Industrial area. $4,000,000.

▲ **Que., Bristol**—IRON ORE DEPOSITS DEVELOPMENT—Minnesota Huron Mining Co. W. S. Moore, pres., 118 W. 2 St., Duluth, Minn., U. S. A. development of iron ore deposits here, roads, rail spur will also be required, $2,500,000.

UNCLASSIFIED

▲ **Oklahoma**—COMPRESSOR UNITS, etc.—Oklahoma Natural Gas Co., 401 N. Harvey St., Oklahoma City, addnl. compressor unit at Maysville, $225,000; 12,500 h.p. gas compressor station at Ringwood, $2,746,000; 1,320 h.p. gas compressor unit at N. W. 50 and Santa Fe Sts., Oklahoma City, $127,000; 16 in. gas line from 50 and S. Santa Fe to Edmond St., Oklahoma City, $419,000. W. R. Kubista, 624 S. Boston St., Tulsa 2, engr. CD 11/27.

▲ **Pennsylvania**—RAILROAD WORK—Reading Co., E. L. Gosnell, ch. engr., Reading Terminal, Phila., railroad work of various types, various locations in state. $8,000,000.

▲ **Pa., Morrisville** — RAILROAD WORK — Reading Co., E. L. Gosnell, ch. engr., Reading Terminal, Phila., railroad spur, Fairless Works. $1,500,000.

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OFFICIAL PROPOSALS

Bids: November 15, 1951

Pedestrian Tunnel Under Rt. 6, Sec. 23B

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of a Pedestrian Tunnel under Route 6, Section 23B, in Caldwell Township, Essex County. The principal items of construction are:

Estimated:
316 cu. yds. Concrete in Structures
36,700 lbs. Reinforcement Steel in Structures

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Thursday, November 15, 1951, at eleven o'clock (11:00 A.M. — EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: December 7, 1951

Rocky Gorge Dam and Pumping Plant on Patuxent River Laurel, Maryland

Sealed proposals, addressed to the Washington Suburban Sanitary Commission for constructing the ROCKY GORGE DAM AND PUMPING PLANT on the Patuxent River near Laurel, Maryland, will be received in the office of the Commission, Hamilton Street, Hyattsville, Maryland, until Friday, December 7, 1951, at 11 A.M., Eastern Standard Time, at which place and time they will be publicly opened and read.

The dam will consist of an Ambursen Type reinforced concrete slab-and-buttress dam, about 725 feet long and 130 feet high, with earth embankments at each end.

Alternate bids will also be received on a mass-concrete gravity type dam.

The approximate quantities of the principal items of each of the two types of dam are as follows:

Ambursen Type Dam
- 8,500 c. y. Mass excavation, common
- 2,500 c. y. Trench excavation, common
- 1,000 c. y. Mass excavation, rock
- 2,500 c. y. Trench excavation, rock
- 25,200 c. y. Reinforced concrete in slabs, buttresses, piers, abutments and bridge
- 1,500 c. y. Mass concrete in cut-offs and fills
- 1,100 tons Reinforcing steel
- 5,000 s. f. Line drilling

Gravity Type Dam
- 11,000 c. y. Mass excavation, common
- 500 c. y. Trench excavation, common
- 19,000 c. y. Mass excavation, rock
- 1,500 c. y. Trench excavation, rock
- 35,000 s. f. Line drilling
- 5,400 c. y. Reinforced concrete in piers, walls, hearth and bridge
- 90,000 c. y. Mass concrete in dam and cut-off
- 370 tons Reinforcing steel

Items Common to Both Types of Dam
- 1,500 c. y. Earth embankment
- 2,500 c. y. Backfill
- 1,000 l. f. Drilling and grouting holes 25 ft. deep
- 2,000 l. f. Drilling and grouting holes 50 ft. deep
- 13 tons Structural steel in trash racks
- 7 Tainter gates, 15 ft. x 27 ft.
- 2 Traveling hoists for Tainter gates
- 1 48-inch free discharge valve
- 1 Caterpillar gate, 6 ft. x 6 ft., with hoist
- 3 Sluice gates, 6 ft. x 8 ft., with hoists

Pumping Plant and Pipeline, Common to Both Types of Dam
- 1,000 c. y. Excavation for pipeline, common
- 6,000 c. y. Mass excavation for penstock, rock
- 4,000 c. y. Mass excavation for pumping plant, rock
- 1,200 c. y. Mass excavation for substructure, rock
- 1,000 c. y. Reinforced concrete in substructure
- 136,000 lbs. 60-inch diameter welded steel pipeline and penstock
- 3 Pumps with 600 hp motors, capacity 12,600 G.P.M. at 165-ft. head
- 3 Hydraulic turbines, 600 hp, complete

The Commission has received a CMP allotment.

The plans and specifications and bidding documents may be secured from the office of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland, or from the Commission's consulting engineers, Ambursen Engineering Corporation, 295 Madison Avenue, New York, or M & M Building, Houston, Texas. A deposit of $10 is required for each set of plans and specifications, which will be refunded in full upon their return in good condition within 15 days after date of bidding.

The right is hereby reserved to reject any or all proposals, and to waive informalities, as the interest of the Commission may require.

No bidder may withdraw his bid within 45 days after the opening thereof.

The successful bidder will be required to be bonded to the Commission to a sum equal to 100% of the amount of his proposal.

Each proposal must be accompanied by a certified check or bidder's bond for 5 per cent of the amount of the proposal.

WASHINGTON SUBURBAN
SANITARY COMMISSION
Raymond W. Bellamy
L. S. Ray
J. Norman Ager
Commissioners

Bids: December 11, 1951

San Jacinto River Dam

HOUSTON, TEXAS

Sealed bids, in duplicate, will be received by the City Secretary of the City of Houston, until 3:00 p.m. C.S.T., Tuesday, December 11, 1951, and all bids will be opened and publicly read in the City Council Chamber at 3:15 p.m. on that date, for constructing the

SAN JACINTO RIVER DAM, INTAKE AND 72 INCH REINFORCED CONCRETE CONDUITS

The dam consists of an Amubursen Type reinforced concrete slab-and-buttress spillway 3160 feet long and 47 feet high, with earth embankments at each end. The following approximate quantities are required for the principal items:
- 80,000 c.y. Stripping
- 46,000 c.y. Core trench excavation
- 860,000 c.y. General excavation
- 50,000 c.y. Trenching, and finishing excavation
- 18,000 c.y. Backfill
- 360,000 c.y. Embankments, Impervious
- 755,000 c.y. Embankments, Pervious
- 250,000 c.y. Embankments, Unclassified
- 12,000 c.y. Topsoil
- 73,000 c.y. Reinforced concrete in foundation floors, mats, and paving
- 55,000 c.y. Reinforced concrete in buttresses, piers, deck slabs, abutments and structures
- 40,000 c.y. Gravel fill
- 4,000 c.y. Rockfill
- 2,000 c.y. Oyster shell road surfacing
- 6,500 tons Steel sheet piling
- 7,000 tons Reinforcing steel
- 20,000 sq. ft. premolded joint filler
- 3,600 lbs. copper water seals
- 2 Steel Tainter gates
- 2 Hinged steel flashboards
- 4 Electric gate hoists
- 1 Steel foot bridge
- 1 Intake tower, complete
- 1,150 Lin. Ft. dual 72" reinforced concrete conduit

The City has already purchased and will supply to the Contractor all miscellaneous steel and metallic items as follows: all reinforcing steel, cut and bent; all steel sheet piling; 2 Tainter gates and 2 steel flashboards, fully fabricated; 4 complete gate hoists with motors; 3 sluice gates and operating mechanisms with fabricated steel racks; all pipe rail, completely fabricated; steel foot bridge, completely fabricated; all miscellaneous and structural steel items required for dam intake tower and conduits completely fabricated.

The City has received a CMP allotment.

The plans, specifications and bidding documents may be secured from the office of the Director of the Utilities Department, City Hall, Houston, or from Ambursen Engineering Corporation, 295 Madison Avenue, New York or M & M Building, Houston, Texas.

Bids must be made on the standard proposal form, in duplicate, and must be accompanied by Cashier's check or Bidder's Bond in an amount equal to 10% of the total maximum bid price.

The City reserves the right to reject any and all bids, or to accept any bid deemed advantageous to it.

A deposit of $50 is required for each set of plans and specifications, which will be refunded in full upon their return in good condition within 15 days after date of bidding.

M. H. Westerman
City Secretary

October 17, 1951

Bids: November 12

Installation of Aircraft Emergency Horn

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-140.012

Sealed proposals for the installation of an aircraft emergency horn at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:30 A. M. Monday, November 12, 1951 at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, November 1, 1951

Bids: November 26, 1951

Distribution Reservoir

Bids will be received by the City Manager of the City of Newburgh, New York until 2 P.M., November 26, 1951 at the Office of the City Manager, City Hall, 81 Broadway, Newburgh, New York, for constructing a distribution reservoir and appurtenances.

Copies of the plans and specifications may be obtained either from the Department of Water, City of Newburgh, Du Bois and Carter Streets, Newburgh, N. Y. or from Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, N. Y. upon deposit of $25.00 which will be refunded if the plans and specifications are returned in good condition within ten days of the date of receipt of bids.

The work to be done includes constructing a reinforced concrete distribution reservoir approximately 137 feet by 91 feet in plan and 23 feet deep together with a gate chamber, piping, grading and appurtenances; connecting pipe line of 12" and 20" cast iron pipe approximately 1,000 feet long and a drain line of 21" tile pipe approximately 300 feet long.

Each proposal must be accompanied by a certified check or bid bond in amount equal to 25% of the proposal.

The right is reserved to consider bids for 30 days before awarding any contract, to accept any bid or to reject any or all of them.

FRED D. BAYNE, City Manager
City of Newburgh, New York

Newburgh, N. Y., October 25, 1951

OFFICIAL PROPOSALS

Bids: November 15, 1951

FOUNDATIONS AND MISCELLANEOUS STRUCTURES
NORTHEAST STATION
FOR THE
DEPARTMENT OF WATER SUPPLY
CITY OF DETROIT, MICHIGAN

CONTRACT NO. NE-2

Sealed proposals for the construction of Foundations and Miscellaneous Structures for the Northeast Station, on a 84 acre site at 11000 East Eight Mile Road, will be received by the Board of Water Commissioners of the City of Detroit. Proposals shall be addressed to the Board of Water Commissioners, City of Detroit, Room 506 Water Board Building, 735 Randolph Street, Detroit 26, Michigan, and shall be endorsed "Proposal for Contract No. NE-2". Proposals will be received until 10:00 A.M. Eastern Standard Time, November 15, 1951, at which time they will be opened and read aloud in the Board Room, Fifth Floor, Water Board Building, 735 Randolph Street, Detroit 26, Michigan.

Included in the work is the construction of reinforced concrete foundation slabs for the Filter Building, Wash Water Building, Weir Chamber, Switch House, Gate Well Chamber, the High Lift Plant and Raw Water By-pass Chamber (slabs and some walls), the Filtered Water Conduits, Filtered Water Junction Chamber No. 2, various drain lines with appurtenances and an electrical grounding system. The total plan area of the foundation slabs exceeds 141,000 square feet. The foundation slabs, generally, are to be constructed on cast-in-place concrete end-bearing piles, the base lengths of which are established as 104 linear feet with the total number required in excess of 4600. The foundation slabs and other structures and drains are to be made in excavations, included in this Contract, at depths of from 18 feet, approximately, to 29 feet, approximately, below existing site grade.

The Contract Documents, including the Notice to Bidders, the Forms of Proposal and Agreement, the Specifications, and the Contract Drawings, may be examined during business hours, at the office of the Department of Water Supply, Room 706 Water Board Building, Detroit, Michigan. The Contract Documents may be obtained by making a deposit of Twenty-Five Dollars ($25.00) per set, which sum will be refunded upon the return of the complete Contract Documents in good condition within thirty (30) days after the bid date, or if used in making a bona fide proposal.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount not less than five per cent (5%) of the total lump sum price bid, drawn payable to the City of Detroit, Board of Water Commissioners, as security for the acceptance of the Contract.

No proposal may be withdrawn for at least sixty (60) days after the scheduled closing time for receipt of bids.

The Board of Water Commissioners reserves the right to waive any informality in any bid and to accept any bid, or to reject any or all bids, should it deem it to be in the best interests of the City of Detroit so to do.

CITY OF DETROIT
BOARD OF WATER COMMISSIONERS
R. K. Williams, President
Oscar Wagner, Vice President
George A. Shaffer
Alfred J. Simpson
L. G. Lenhardt, Superintendent
General Manager and Chief Engineer
E. H. Rauer,
Acting Secretary

Bids: January 9, 1952

Wadema Tunnels

THE HYDRO-ELECTRIC COMMISSION, TASMANIA.

The Commission is inviting Tenders for the construction of three tunnels in connection with hydro-electric projects on the River Derwent Catchment area in Tasmania.

(a) Wayatinah Tunnel: Cross section 473 sq. ft., length 21,500 ft. Time for completion—40 months.

(b) Dee Tunnel: Cross section 124 sq. ft., length 10,500 ft. Time for completion—24 months.

(c) Mossy Marsh Tunnel: Cross section 119 sq. ft., length 5,250 ft., or alternatively cross section 130 sq. ft. and length 7,920 ft. Time for completion—24 months.

The work required includes excavation mainly in hard rock, the open-cut portals, and concrete lining where necessary.

The successful tenderer will be required to bring his plant and most of his labour from sources outside Tasmania.

The contracts will be on a schedule of rates basis and may be awarded as one to a single tenderer or separately to two or more tenderers.

Consideration will be given only to tenders from firms having proved experience in this class of work.

Particulars and the tender documents may be obtained from the undersigned, and applications should be accompanied by a preliminary deposit of £100 Australian, which is returnable on receipt of a bona fide tender. This preliminary deposit formality may be waived in the case of applications received from firms of standing and repute. A set of the tender documents is available for inspection only at the offices of the Australian Trade Commissioner, 630 Fifth Avenue, New York, N. Y.

Sealed tenders, endorsed on the cover "WADEMA TUNNELS" are to be delivered to the undersigned by noon on Wednesday the 9th day of January, 1952.

The Commission does not bind itself to accept the lowest or any tender.

W. R. Spinner,
Secretary
The Hydro-Electric Commission,
Hobart,
Tasmania.

Bids: November 20, 1951

Miscellaneous Work, Totowa, N. J.

Notice is hereby given that sealed proposals will be received in the office of the Director, Division of Purchase and Property, Room 318, State House, Trenton 7, New Jersey, for the following:

General work, structural steel, plumbing, heating and ventilating, and electric work in connection with Nursery Building and Housing for Patients at the North Jersey Training School at Totowa, New Jersey.

Bids for the above will be received at the office of the Director, Division of Purchase and Property, State House, W. State St., Trenton 7, New Jersey on Tuesday, November 20, 1951 at two (2:00) o'clock and will be opened and read immediately thereafter. Bids must be made on the standard proposal form, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than 5% of the amount of the bid, cash, in the amount of 5% of the bid or a bid bond in the amount of 5% of the bid, and must be delivered at the above place on or before the hour named, as no bid will be accepted after the hour specified. Bids not submitted on the standard proposal form or enclosed in other than special addressed envelopes will be considered informal and will be rejected. The Director reserves the right to reject any and all bids and to award contract in part or whole if deemed to the best interests of the State to do so. The successful bidder will be required to qualify for surety bond in the full amount of the contract, of a company authorized to do business in the State of New Jersey.

Plans and specifications, form of bid, contract and bond for the proposed work are on file and may be obtained upon application to the Director, Division of Purchase and Property, State House, Trenton, New Jersey on deposit of twenty-five dollars ($25.00) for each set; this amount to be refunded to the bidder upon receipt of same in good condition within 30 days after the award of the contract.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director

Bids: November 5, 1951

Manholes Frames & Covers

WASHINGTON SUBURBAN SANITARY COMMISSION
INQUIRY NO. 600732
FURNISHING AND DELIVERING
MANHOLE FRAMES & COVERS:
MANHOLE STEPS AND INLET FRAMES & COVERS

Sealed proposals for furnishing and delivering five-hundred (500) W.S.S.C. Standard Manhole Frames & Covers "S"; three-thousand (3,000) W.S.S.C. Standard Manhole Steps and eighteen (18) W.S.S.C. Single Square Inlet Frames & Gratings will be received in the office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland, until 10:30 A.M., Monday, November 5th, 1951 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission.

Raymond W. Bellamy, Chairman
L. S. Ray
P. Norman Ager
Commissioners

Attest:
James B. Parkhill
Secretary-Treasurer

OFFICIAL PROPOSALS

Bids: November 19, 1951

Project VI-I-1, Charlotte Amalie, St. Thomas

VIRGIN ISLANDS HOUSING & REDEVELOPMENT AUTHORITY
CHARLOTTE AMALIE, ST. THOMAS,
VIRGIN ISLANDS, U. S. A.

The Virgin Islands Housing & Redevelopment Authority will receive sealed bids until 2 p.m. AST on the 19th day of November, 1951, at its office in Charlotte Amalie, at which time and place all bids will be publicly opened and read aloud, for the construction of a Housing Development at St. Thomas, V. I. described thus:

THIRTY (30) REINFORCED CONCRETE BUILDINGS WITH LOAD BEARING CLAY BLOCK WALLS, OF THE TWO-STORY TYPE, COMPRISING TWO HUNDRED FORTY (240) DWELLING UNITS; TOGETHER WITH UTILITIES AND SITE IMPROVEMENTS, UNDERGROUND CISTERNS, INFILTRATION GALLERY AND TREATMENT PLANT, ALL IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AS PREPARED BY SCHIMMELPFENNIG, RUIZ & GONZALEZ, ARCHITECTS, RIO PIEDRAS, PUERTO RICO.

Proposed forms of contract documents, including plans and specifications, are on file at the office of the Virgin Islands Housing and Redevelopment Authority, Box 68, Charlotte Amalie, St. Thomas, Virgin Islands. These may also be obtained from the offices of Schimmelpfennig, Ruiz & Gonzales, Architects, Monserrate Building, Rio Piedras, P. R.

Copies of the documents may be obtained by prospective bidders upon depositing a certified check for One Hundred ($100.00) with the Virgin Islands Housing & Redevelopment Authority for each set of documents so obtained. Such deposit will be refunded upon return of the plans and documents in good condition within a period of ten (10) days after the opening of bids.

A certified check or bank draft, payable to the Virgin Islands Housing & Redevelopment Authority, U. S. Government Bonds or satisfactory bid bond executed by the bidder and acceptable surety, in an amount equal to five per cent (5%) of the bid shall be submitted with each bid.

The successful bidder will be required to furnish satisfactory performance and payment bond.

Bidders attention is called to the fact that under the contract, the Contractor shall be required to pay not less than the minimum wage rate set forth in the specification and to comply with the minimum wage laws now in effect in St. Thomas, V. I., and with any minimum wage laws that may come into effect during the life of the Contract, without increase in contract price.

The Virgin Islands Housing & Redevelopment Authority reserves the right to reject any or all bids and to waive any informalities in bidding.

No bids shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of the Virgin Islands Housing & Redevelopment Authority.

VIRGIN ISLANDS HOUSING & REDEVELOPMENT AUTHORITY
HENRY W. DE LAGARDE,
Executive Director

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 703C-217 for furnishing labor and materials and performing all work for Installing armor rods and attaching vibration dampers to overhead ground wires on the existing Fort Randall-O'Neill and Alliance-Chadron 115-kilovolt transmission lines, Transmission Division, Nebraska-South Dakota and Nebraska, Missouri River Basin Project, will be mailed to P. O. Box 280, Casper, Wyoming, or delivered to the office of the Bureau of Reclamation in time for the public opening at 10 a.m., Mountain Standard Time, November 13, 1951, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming.

Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $0.50 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

(Continued on page 188)

OFFICIAL PROPOSALS

Bids: November 14, 1951

New York Highway Projects

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time Wednesday, November 14, 1951, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. NICKERSON, Dist. Engr., 353 Broadway, Albany, N. Y.				
		DISTRICT No. 8 J. S. BIXBY, Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y.				
12 Counties 5 Cities	FARC51-17 FARC51-24	Installation of Automatic Recording Traffic Counters in Dists. 1 & 8 Proj. No. SWHP 1(8)		Installation of 25 Automatic Recording Traffic Counters	$2,400 Plans $15	$42,000
		DISTRICT No. 2 L. KETCHUM, Dist. Engr., 109 No. Genesee St., Utica, N. Y.				
		DISTRICT No. 3 WM. ROBINSON, Dist. Engr., Weigh Lock Bldg., Syracuse, N. Y.				
		DISTRICT No. 7 R. F. HALL, Dist. Engr., 444 VanDuzee St., Watertown, N. Y.				
13 Counties 5 Cities	FARC51-18 FARC51-19 FARC51-23	Installation of Automatic Recording Traffic Counters in Dists. 2, 3, & 7 Proj. No. SWHP 1(8)		Installation of 28 Automatic Recording Traffic Counters	$2,800 Plans $15	$44,100
		DISTRICT No. 2 L. KETCHUM, Dist. Engr., 109 No. Genesee St., Utica, N. Y.				
Oneida	RC51-79	Cleveland-Vienna, Pts. 3 & 4, S. H. 8102-8103	0.27	Asph. Conc. Ty. 1A, Opt.	$3,000 Plans $10	$59,000
		DISTRICT No. 3 WM. ROBINSON, Dist. Engr., Weigh Lock Bldg., Syracuse, N. Y.				
Cayuga	FAS851-25	Fosterville-Throopsville, C. R. 10 Proj. No. S364(1)	3.59	Bit. Mac. Opt.	$14,000 Plans $15	$243,000
		DISTRICT No. 4 A. R. MULLIGAN, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Monroe	FAC51-7	Rochester City: Ridge Road West (Mt. Read Blvd. to Lake Ave.) Proj. No. U402(6)	1.67	Asph. Conc. Ty. 2A = 1.60 mi. Misc. Work = 0.07 mi.	$40,000 Plans $25	$762,000
		DISTRICT No. 5 C. R. WATERS, Dist. Engr., 65 Court St., Buffalo, N. Y.				
Cattaraugus	FAS SH51-9	Ellicottville-Springville, Pt. 1 Proj. S365(1)	9.34	Asph. Conc. Ty. 1A, Opt. = 9.17 mi. Misc. Work = 0.17 mi. .23' Conc. Slab	$70,000 Plans $50	$1,222,000
		DISTRICT No. 6 H. F. BRUMM, Dist. Engr., 30 West Main St., Hornell, N. Y.				
Chemung & Tioga	FARC51-66	Erin-Van Etten-Spencer, Pts. 2 & 3, S. H. 8010-5657 Spencer Village, S. H. 9091 Spencer-Candor, Pt. 1, S. H. 845 Proj. No. F58(3), S730(2)	5.01	Asph. Conc. Ty. 1A, Opt.	$53,000 Plans $15	$952,000
		DISTRICT No. 8 J. S. BIXBY, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Dutchess	FARC51-76	Rhinebeck-Hyde Park, S. H. 432 Hyde Park-Staatsburg, S. H. 5135 Proj. No. F322(10)	2.48	9' Cem Conc. Pavt., 44' Var Wide	$48,000 Plans $10	$813,000
Westchester	TSP51-2	Grade Separation of Underhill Road (Co. Rd. 131) & Taconic State Parkway	0.23	Asph. Conc. Type 1A, Opt. 8½"-2¾" Sp. Conc. Rigid Frame	$16,000 Plans $15	$274,000
Westchester	FARC51-74	White Plains-Rye Lake, S. H. 5226 Lake Street, S. H. 9247 Proj. No. S376(1)	1.84	9" Cem. Conc. Pavt., 24' Wide	$25,000 Plans $10	$457,000
		DISTRICT No. 9 F. W. DONOVAN, Dist. Engr., 71 Frederick St., Binghamton, N. Y.				
Broome	FAC51-5 FARC51-50	Binghamton-City: Court St., FAC48-7 Vestal, S. H. 420 Park Bridge, S. H. 127 & Binghamton-Windsor, Pt. 2, S. H. 5022 Proj. No. U401(8); U344(17)	2.34	Landscaping	$1,100 Plans $10	$20,000
Chenango	FARC51-78	Norwich-South New Berlin, Pt. 2, S. H. 1394 Proj. No. F620(8)	0.11	Misc. Work 35' Concrete Slab	$3,000 Plans $10	$52,000
		DISTRICT No. 10 J. J. DARCY, Dist. Engr., Montauk Highway at Little E. Neck Rd., Babylon, L. I., N. Y.				
Suffolk	FARC51-75	Cold Spring-Huntington-Fort Salonga, Pt. 2, S. H. 1632 Proj. No. F566(4)	1.45	Asp. Conc. Ty. 1A, Opt.	$8,000 Plans $10	$153,000
Suffolk & Nassau	FARC51-51	State Highways Nos. 9018-8474-8478-8470-8440-8444-8445-8460-1841-8291-1883-1274 Proj. Nos. F541(8); F985(6)	19.10	Landscaping = 17.00 mi. Landscaping & Misc. Work = 2.10 mi.	$3,500 Plans $10	$62,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders". When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated. The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

OFFICIAL PROPOSALS

Bids: November 20, 1951

Electric Substations & Transformers

CONTRACT 414

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, November 20, 1951, for Contract 414, for furnishing, testing and delivering two 150-Kva. indoor unit substations and two 45-Kva. indoor and three 15-Kva. outdoor transformers for the Neversink and East Delaware intake chambers and the Downsville release water chamber of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of two thousand dollars ($2,000.00), for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawing, requirements as to surety, etc., can be obtained in Room 1311, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, RUFUS E. McGAHEN, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; RICHARD H. BURKE, Secretary.

U. S. Government

General Services Administration, Public Buildings Service, Washington, D. C., Oct. 22, 1951.—On or about Oct. 24, 1951 bidding material for Changes and Additions to Mail Handling Equipment in connection with the Extension and Remodeling of the Terminal Annex Extension (Operation No. 1), at Los Angeles, California, will be available for distribution to general contractors by this office. Applications from general contractors interested in bidding on this work, for not to exceed 2 sets of drawings and specifications, should be filed promptly with this office and the bidding material will be forwarded as soon as available. Bids will be opened on the date named in the Prebid Documents, which will be about 6 weeks after the bidding material is available for distribution. Available for construction—$225,000. Bidding material will be available at Room No. 1304 General Services Building, 19th and F Streets, N. W., Washington 25, D. C., Phone EXecutive 4900, Extension 2397.

EMPLOYMENT

(Continued on page 189 & 190)

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

ASSISTANT PLANT Engineer for Water Supply—Experience required in the operation of electrically driven pumps, generators, and general maintenance of a water pumping plant. Apply by mail giving qualifications, experience, and salary desired. P-2288, Engineering News-Record.

CONSTRUCTION ENGINEER: To take charge of entire construction program of Consulting Engineering firm. Work involves mainly water, sewer and sewage treatment projects aggregating about $1,000,000 a year. Permanent position with view to eventual interest in firm. Salary open. Location upstate New York. P-2230, Engineering News-Record.

(Continued on the opposite page)

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
Courses of instruction by mail. Forty-first year
Information sent without obligation. Write today.

WILSON Engineering Corp.
College House Offices - HARVARD SQUARE, CAMBRIDGE, MASS.

WANTED

SANITARY ENGINEER

A large American Company in Venezuela requires an experienced graduate Sanitary or Civil Engineer. Must have at least three years' experience in sanitary engineering. Will be required to make inspections and recommendations of sanitation facilities and programs including water supply and treatment, sewerage systems and treatment plants, insect control, slaughter houses, mess halls, etc.
Write giving age, marital status, education, and detailed experience resume.

Box 308-A—Radio City Station
New York 19, New York

STRUCTURAL ENGINEER

With 10 to 15 Years Experience in Reinforced Concrete and Structural Steel Design for Electric Utility Work. Write to

STRUCTURAL ENGINEER
PENNSYLVANIA POWER & LIGHT CO.
Allentown, Pa.

POSITIONS VACANT
(Continued from opposite page)

CONSTRUCTION SUPERINTENDENT. Permanent position. Must be top grade building construction management man with extensive industrial and monumental project experience. Nationally prominent construction company established over 50 years offers good opportunity to right man. Our Personnel know of this ad. A complete experience record is desired. Address Box P-2079, Engineering News-Record.

ELECTRICAL EXECUTIVE familiar with all phases of large Electrical Contracting business who from past experience in similar executive capacity is capable of becoming Executive Manager of a Corporation successfully established locally and semi-nationally installing large industrial and power systems with an excellent past record. Registered Engineer preferred. Owner desires eventual retirement. North Central location. A very unusual offering and a life time opportunity to the right party. State personal, educational and experience facts fully. Confidential and agreeable financial arrangement understood. P-2139, Engineering News-Record.

ENGINEER OF Sanitation, 35-50, responsible administrative engineering work in Health and Sanitation Division, Public Works Dept. Salary $5344—$6566 per year. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

ENGINEERS WITH experience in preparation of plans for sewage and water treatment projects or related experience such as structures, hydraulics, etc. Location Northwestern Ohio. P-2319, Engineering News-Record.

FIELD ENGINEER. Permanent position. Desired for nationally prominent construction company. Man desired must have had heavy experience on layout work for foundations and building interiors. When replying, forward complete experience record. Address Box P-2080, Engineering News-Record.

HEATING AND Refrigeration Engineer wanted. Must be capable of handling mechanical layout, design, and supervision of such installation. Locations of offices served are Racine, Wisconsin; Waukegan, Illinois; Lake Forest, Illinois; and Evanston, Illinois. Pay commensurate with ability. The firm is one of the largest plumbing, heating and refrigeration companies between Chicago and Milwaukee, and is expanding its services yearly. Stiles & Horne, Inc., 648 North Western Ave., Lake Forest, Illinois.

NEW JERSEY Crushed stone, sand gravel and bituminous concrete producer requires assistant in Engineering Dep't. Splendid opportunity for advancement. Write stating qualifications. P-2208, Engineering News-Record.

SANITARY ENGINEER—3-5 years' experience industrial waste disposal, sewage and water treatment. Permanent. Retirement plan, free insurance. Write details to Personnel Division, H. J. Heinz Company, P. O. Box 57, Pittsburgh 30, Pa.

MECHANICAL ENGINEER

Excellent opportunity for graduate mechanical or civil engineer with at least 4 years experience in industrial designing including detailing of structural steel and reinforced concrete. Permanent position. Age between 25-45. Salary open. Give resume and full qualifications in first letter.

J. T. BAKER CHEMICAL CO.
Phillipsburg, New Jersey

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service established 1920, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

CIVIL ENGINEER — Assoc. M. ASCE; registered Three states; C. E. Degree; 42; married; 17 years experience in industrial plant planning, layout, design and supervision of construction, institutional building design, estimating and specifications; plant engineer's office; office supervision and management. Prefer south or midwest. Available in sixty days. PW-2232, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, 46, 22 years experience heavy construction—Bridge foundations, powerhouses, floodwalls, cofferdams and highways. Familiar with all heavy equipment. Employed but desire change. PW-2269, Engineering News-Record.

ENGINEER SUPERINTENDENT, graduate, 32, 8 years varied construction experience: Heavy equipment, 2 years sales. Desire to relocate Southwest. Substantial salary required for consistent executive service. Write or wire M. E. Rainey, 501 Johnson Road, Falls Church, Va.

SUPERINTENDENT—FIFTEEN years experience in heavy construction. Specialized in Heavy Blasting, Earth Moving and Mass Concrete. PW-2229, Engineering News-Record.

SUPERINTENDENT. 25 years diversified heavy construction experience — bridges, dams, disposal plants, pumping stations, concrete structures, sewer and water systems, heavy excavation rock and soil, water front work, etc. Good organizer, know men and equipment, familiar with labor and material cost and distribution. Good background. Location immaterial. PW-2216, Engineering News-Record.

SELLING OPPORTUNITY WANTED

REINFORCED CONCRETE supt. Building & Heavy constr. Leaving Jan. 1 for Capetown to represent American interests. Will introduce other non-competitive equip. & products, arranging contacts with S. African distributors. Virgin field for metal lath & new plaster products. RA-2027, Engineering News-Record.

WANTED

Large engineering firm wishes to acquire several complete plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence.

Box 1206
1474 Broadway New York 18, N. Y.

WANTED

SEMI-TRAILER

Prefer Rogers "T" Drop Deck—25 or 30 Ton. Write Serial No., Specifications, Age, Condition.

N. R. C. CO.
280 Huguenot St. New Rochelle, N. Y.

(Additional Wanted ads on page 192)

DESIGNERS

Heavy Industrial Construction

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P-2153, Engineering News-Record
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FS-2321, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

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3 1 **"C" Tournapull** with an 11 yard heaped scraper; powered by a Caterpillar diesel engine. Very reasonable buy.

4 1 **LeTourneau Tiltdozer blade,** NEW, for a D-6 Caterpillar tractor; cable operated; can be used as a straight dozer blade. Good price.

5 1 **International TD-18 tractor,** wide tracks, with power control unit, and hydraulic arms for bulldozer blade; clean. Very good condition.

6 1 **LeTourneau double drum power control unit,** NEW T series. Excellent buy.

SPECIAL

7 1 **Unit model 1014 truck crane,** 10 ton, ¾ cubic yard capacity, used. Excellent CONDITION, like new. About one year old, seen very little work. Set up for Crane or Clamshell work, has ¾ yd. bucket, 30 feet of boom. Excellent rubber, ten 9.00 x 20 tires. Waukesha engines in truck and crane.

8 1 **Terratrac tractor,** model GT 25, with loader attachment powered by a 25 horsepower Continental gasoline engine. 10 inch crawler pads. About one year old. Moderately priced.

SPECIAL

9 2 **Jaeger 365 cubic foot compressors** powered by International UD-18A diesel engines, four pneumatic tires on each. Very excellent condition.

10 2 **7 yard capacity concrete Hoppers, Jaeger,** 3 gates. Very excellent condition. Ideal for use with Truck Mixers. Eliminate waiting time.

SPECIAL

11 2 **5-½ yard Jaeger High Discharge, end loader, Truck Mixers.** Mounted on LF8W Mack Trucks, with ten (10.00 x 22) 14 ply tires on each truck; powered by Mack EN510A gasoline engines. All equipment new in 1951. Excellent buy.

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14 1 **60cfm Schramm Air Compressor,** serial number 98181.

15 2 **75 cfm Jaeger Air Compressors.**

16 1 **210 cfm Chicago Pneumatic Air Compressor** serial number 301600.

17 3 **Thor number 23 Paving Breakers.**

18 2 **Thor number 25 Paving Breakers.**

19 1 **Thor number 38 Rock Drill.**

20 1 **Cleveland C-9 Paving Breaker.**

21 1 **Cleveland CD-8 Backfill Tamper 1" hex chuck**

22 1 **Thor number 75 Rockdrill** serial number 65127.

23 1 **133 cpm ¾" hex chuck Thor chipping hammer.**

24 1 **36" Mall air powered chain saw.**

25 1 **Beach saw table** 10-A, 14" blade, gasoline powered.

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27 4 **Jaeger Hoister Towers** complete with Hoist and 37 feet of hoister tower. Additional tower available up to 67 feet.

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30 1 **H9-Jackson Hydraulic Vibrator** with 50 feet of shaft.

31 1 **Bailey Vibrator** 2 feet of flexible shaft.

32 2 **Jaeger 1-½ Self Priming Centrifugal Pumps.**

33 5 **Jaeger 2P, two inch pumps,** gasoline powered self priming.

34 2 **Jaeger 3P, three inch self priming centrifugal pumps.**

35 1 **Marlow 3P, three inch pump.**

36 2 **Jaeger 4P, four inch self priming centrifugal pump** gasoline powered, capacity 40,000 gallon per hour.

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42 6 **10 EL Jaeger Concrete Mixers,** with skips and also Hoppers, water tanks, gasoline powered.

43 2 **Jaeger 7 EL Concrete Mixers,** with skips, water tanks, gasoline powered.

44 2 **Jaeger EL Portable Concrete Mixers,** skip loader, gasoline powered.

45 1 **Jaeger 3-½, SNT Hopper Type portable Concrete Mixer,** gasoline powered.

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1950 "V" License Chevrolet Truck

2 Euclid Bottom Dump Trucks—Model #KG-839; WAKH Engine Model #6SRKR22B

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Hanson truck crane
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For rent,—cranes, draglines, backhoes, buckets, and all other accessories.

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50-B Bucyrus Erie, Steamer
1 Yd P&H Shovel & Drag, Model 650, Diesel
Manitowocs, Models 2000-B, 3500, 4500 Draglines
1¾ Yd Koehring Shovel
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2 Yd Lorain, Models 82 & 820 Draglines
2 Yd Lima Model 802 Dragline
2 Yd Northwest Model 80-D Dragline & Shovel
2½ Yd Marion Model 93-M Shovel
2½ Yd Bucyrus Erie Model 43-B Shovel
2½ Yd P&H Model 925 Lc Dragline
2½ Yd Lima Model 1201 Dragline Shovel
2½ Yd Monacahan, Dragline, Electric
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6 & 8 Yd Marion Shovels Electric
15 Ton Northwest Truck Crane
10 Ton Krane Kar
Wiley Whirley, Steamer
10 Yd Monacahan Shovel Electric

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The City of Alpena is to receive bids for sale of the following listed equipment which is located in the municipally-owned Water Works Pumping Station. The generator has not been in use for the past eighteen years.

1 Bullock Generator; Amperes—34.1, Volts—2200, Frequency—60, R.P.M —120.
1 Steam-driven Allis Chalmers Corliss twin expansion reciprocating engine to drive generator.
1 Bullock Exciter—steam operated: Volt Full Load —120. Amperes—100. R.P.M.—180.

The following transformers are attached to the above generator for conversion from 2 to 3 phase use:
1 Westinghouse main conversion transformer. Volts —2300.
1 Westinghouse teaser conversion transformer. Phase—from 2 to 3.

Above equipment is complete.

1 Westinghouse Cooper Hewitt Mercury rectifier sets—converted to constant current transformer. Volts—2300. Cycle—60. Oil filled.
1 Westinghouse watt meters—single phase.
1 Westinghouse amp meters.

The following is also included:

4-inch piping running from steam-driven Corliss engine to 4-inch tee at header above exciter. 2-inch piping from exciter to 2-inch union above exciter.

ADDITIONAL INFORMATION can be received by contacting Mr. Martin Hanson, Superintendent of the Light Department, City of Alpena; or Morris Olsen, City Manager, City of Alpena, Michigan.

BIDS will be received on the above listed equipment in the City Clerk's Office until Monday, December 10, 1951, at 5 P. M.

PLEASE ADDRESS YOUR COMMUNICATION to the Mayor and Municipal Council and mark your envelope "Sealed Bid".

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Equipt. with 50' Boom and 1 C.Y. Clam.
Also Equipt. as Dragline Less Bucket.

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1-D-7 Caterpillar Tractor

Serial #7M3343 with LeTourneau angledozer and D.D.P.C. Unit. Good condition. Price $8500.00 f.o.b. Albany, New York.

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1 25 ton Am. Loc. Crane 50' boom oil burner $7500.00
1 11B2 McK-Terry steam hammer 70' leads & 150' hose as unit ... $3500.00
1 9B2 McK-Terry steam hammer. $1100.00
1 3 Dr. Mundy gas hoist with swinger 70 H.P. $2000.00
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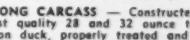

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How They Handle Barges in the Ohio Valley

"You'll find a good many of these cellular steel sheetpile docks in the Ohio Valley," said F. J. Larkin as he inspected the picture below.

Larkin is with the Dravo Corporation's Contracting Division. Dravo pioneered this type of river-barge mooring at its Neville Island (Pittsburgh) boat yard in 1930. As a field superintendent, Larkin has supervised several installations like this.

We asked, "Why are there so many?"

"There are two reasons," he answered. "First, river transportation has attracted an increasing number of industries that must use bulk commodities like coal and oil. And, second, the cellular dock is a natural for handling barges under the stage and flow conditions of the rivers. Moreover, the docks are economical and they can be built in a hurry."

"How is this so?"

"Well, you see what this one is," he said, pointing to the picture. "It's a row of steel sheetpile cells, spaced at suitable intervals on the dock face, along which barges are moored and moved. At the upstream end (right) are cellular ice-breaker piers. These ice breakers also protect the barges during high water. This is a big job—there are many that have only one or two cells.

"Those cells are mighty simple. We build them by first predredging to stable material. Then we anchor a timber ring templet and drive sheet-piles. We put ladders and mooring rings on the steel. Then we backfill the cell up to a grade near the top and place a concrete deck slab on top of the fill. Some of the cells carry barge-haulage gear.

"That's about all there is to it. The cells are designed to a height above maximum river stage, and of a diameter and penetration sufficient to give stability against overturning. Sand and gravel dug from the river will do as fill, as long as it has good shear value and will compact suitably.

"It makes a fast job. No cofferdam or other time-consuming foundation preparations, and no concrete forms to build."

"What about connection with the shore?"

"That depends on the job, but usually it's a bridge carrying conveyors or pipelines, or, more often, just a walkway. Sometimes the river side of a tipple or other structure bears on one or more of the cells, or cells provide foundations for cranes or unloaders.

"And, of course, that brings up the system's flexibility. We build all sorts of layouts, small and large. Frequently we add on to old cellular layouts, and occasionally we revise them."

"That must be a job."

"Not at all," Larkin said. "To remove a cell we knock out the concrete cap, clamshell out the fill and pull the piles. Salvage is almost **100%.**"

"How durable are the cells?"

"The first one built, at Neville Island, in 1930, is still in service today."

"How much of this type of work is there?"

"By mid-1951 we had completed seven projects and eleven more were under way or in the engineering stage," Larkin said, "and remember while we do the majority of the work, others do it, too.

"Last year we had 16 projects. In addition to the one in the picture, here are a few more:

"Steel sheet pile mooring cells and a coal tipple foundation to provide barge loading facilities for a new coal mine at Little Falls, W. Va.

"Ten steel sheet pile cells and one large steel sheet pile ice-breaker at the site of a new power station on the Ohio River in Indiana.

"A new dock for improved barge loading facilities at a mine on the Ohio River near Moundsville, W. Va.

"Foundation for an unloading crane at a public utility car-to-barge transfer point located near Cincinnati.

"An installation, including ice-breakers, for a coal mine on the Monongahela River. An interesting feature of this job is that plans have been made to use the land face of the cells of this dock to provide future dock facilities for a power station which is located close by.

"On the Kannawha River, Dravo put in five square sheet pile mooring posts and three sheet pile circular cells, one of which is a tipple foundation. This provides facilities for barge loading at a public utility coal mine."

"Three new docks for unloading bulk oil, one on the Ohio, one on the Kanawha, and one on the Monongahela River."

THREE-FOURTHS OF A MILE LONG, on the Monongahela River near Brownsville, Pa., this mooring and harbor improvement project serves the Jones & Laughlin Steel Corp. Vesta Mines. The contracting division of Dravo Corp. put in 39 steel sheetpile cells, four of which comprise an ice breaker. Over 125,000 cu yd of material was dredged from the harbor.

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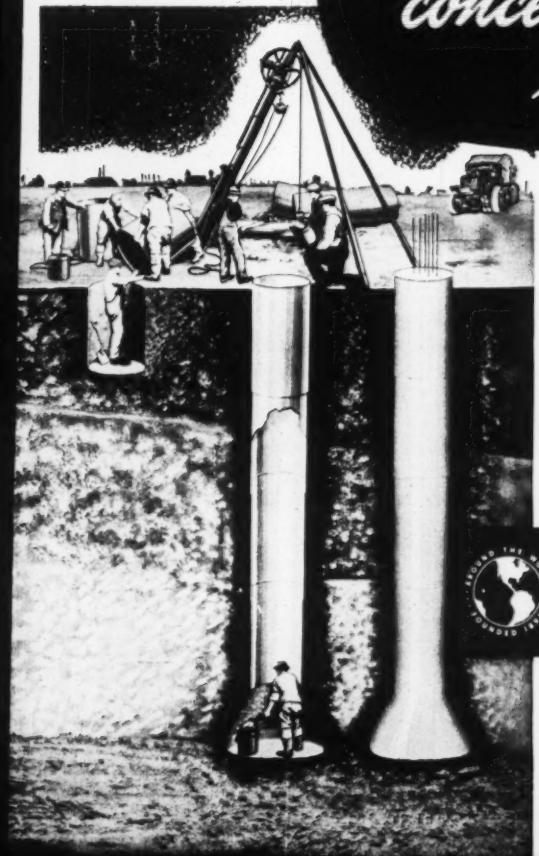
At left, excavating starting pit and placing first cylinder. At center, excavating bell at bottom of the steel-lined shaft. At right, the completed caisson.



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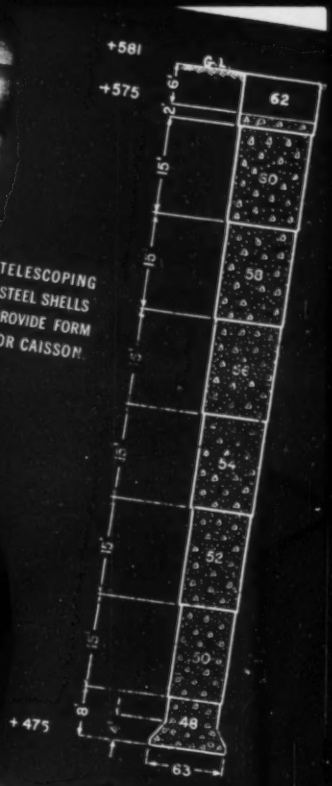

Raymond Gow caissons are efficient and economical for supporting heavy concentrated loads under certain soil conditions. The Gow method consists of hand or machine excavation carried on inside of telescoping steel cylinders. Where the caisson rests on hard ground, a bell is usually formed at the bottom to distribute the load over a large area. Where the caisson rests on rock, the bell is usually omitted. After excavation is completed, the steel cylinders are removed as the concrete is poured.

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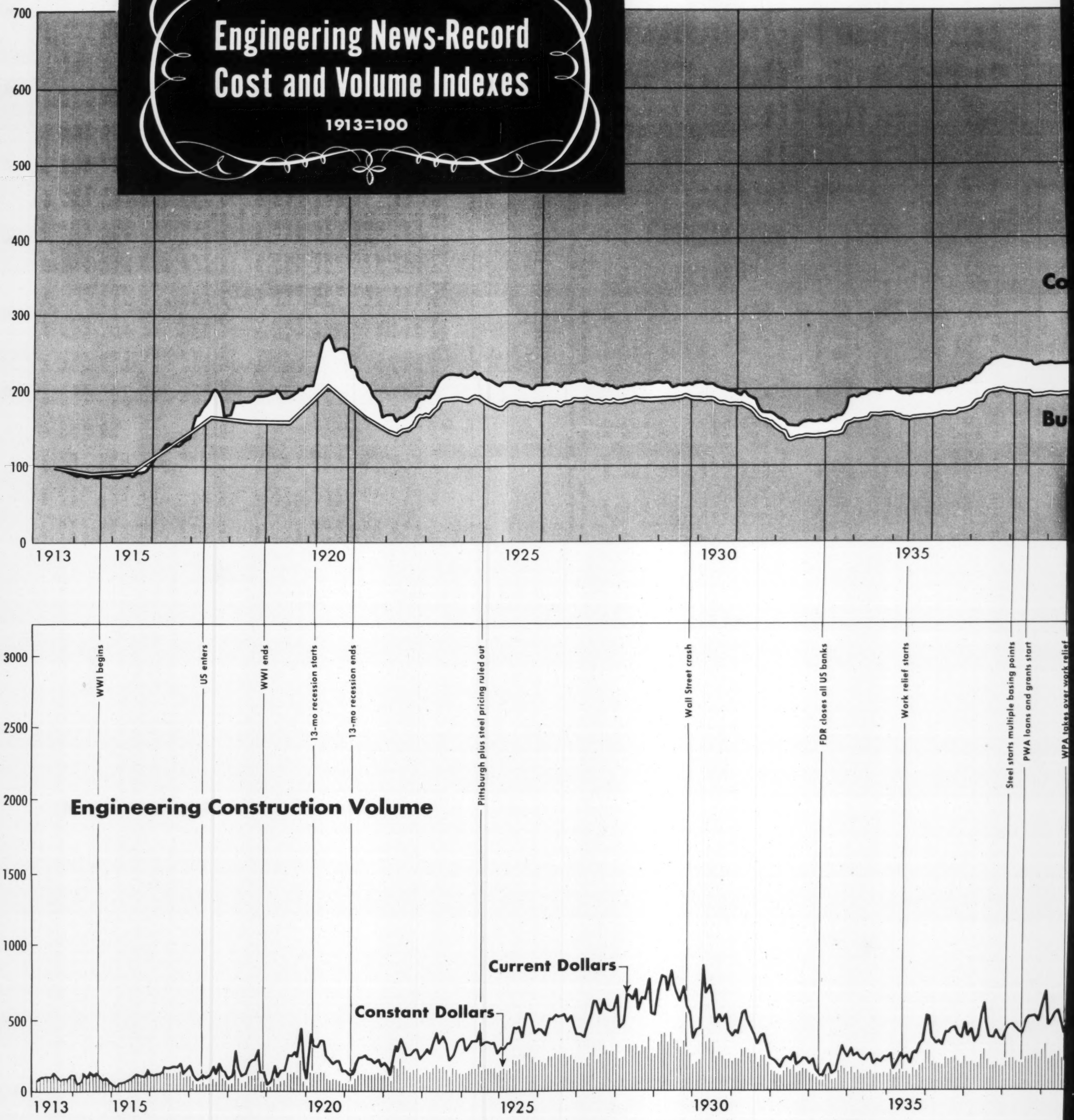

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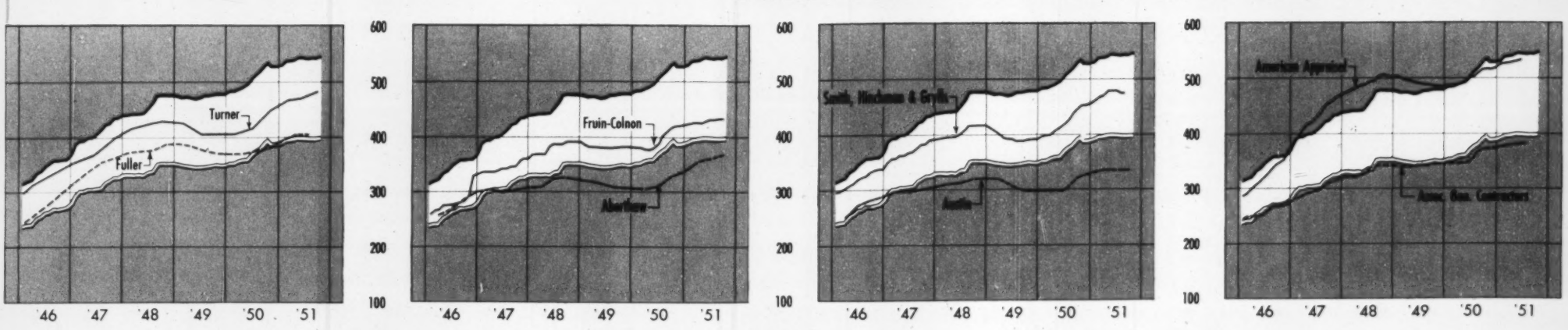
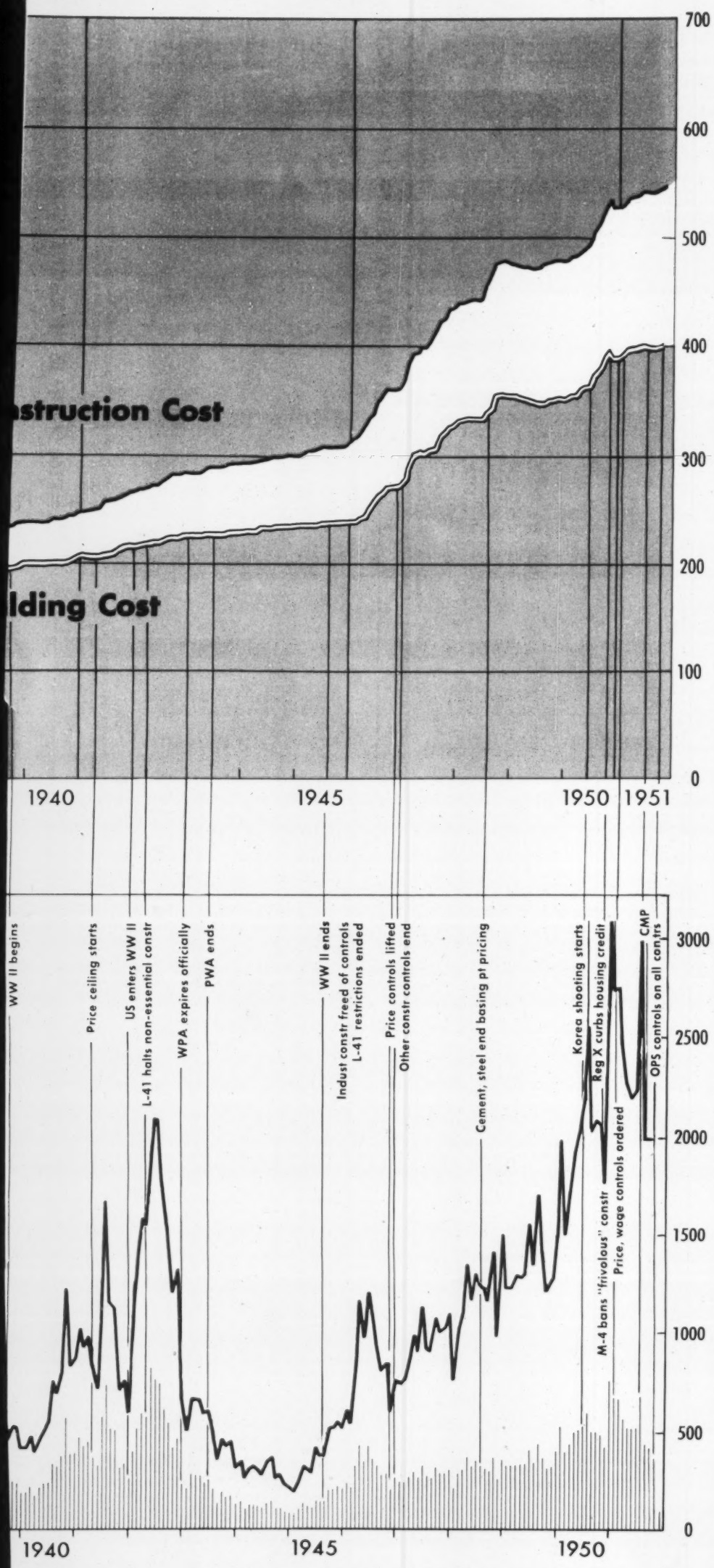
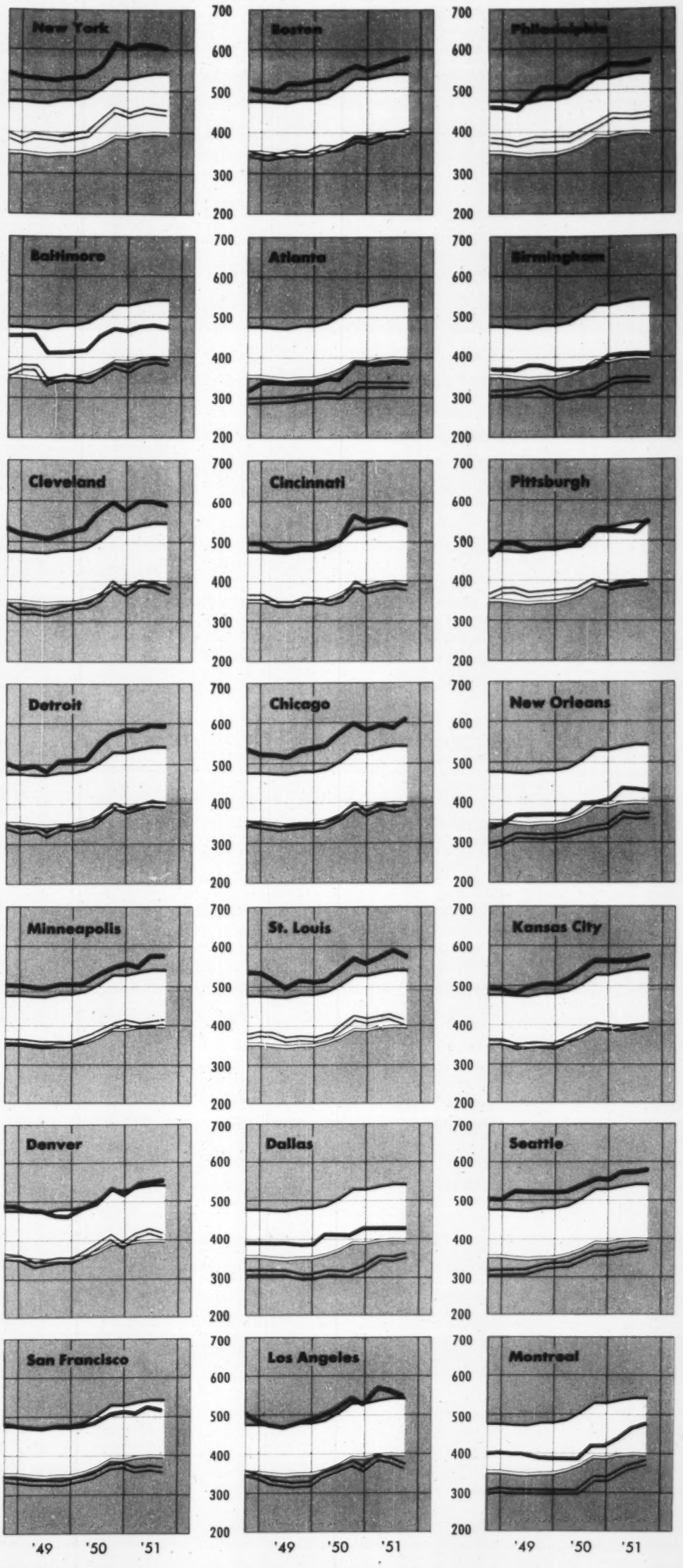




COST INDEXES IN 21 CITIES

1913 = 100



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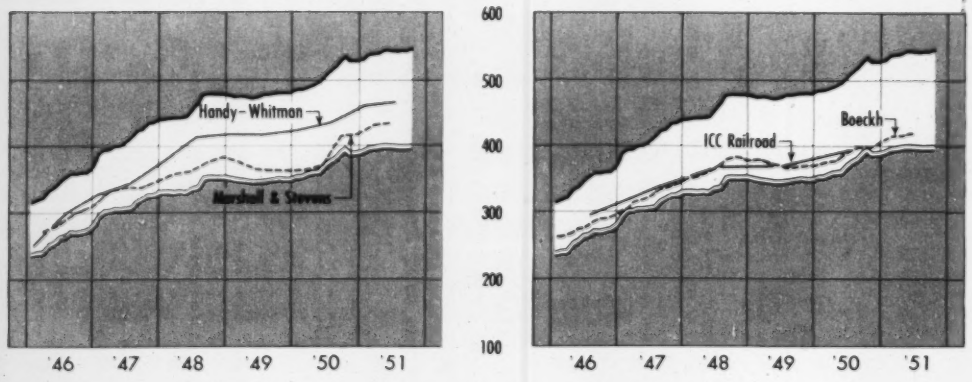

- The ENGINEERING NEWS-RECORD Construction Cost Index was established in 1921, based on price movements in structural steel, portland cement, lumber and common labor. The Building Cost Index was introduced in 1938 to measure also the effect of skilled wage trends on costs. It uses the same materials as those in the construction cost index but skilled labor, instead of common labor.

- A few minor changes have been made in these indexes over the years necessitated by changed conditions in the market. These are recorded in full, together with a complete history of this development and use in ENR, September 1, 1949, page 398. New values are reported at the beginning of each month, based on 1913 = 100. These are weighted aggregative indexes, thus base years can be shifted at will.

- ENR Construction and Building Cost Indexes reflect wage rate and material price trends. They do not adjust for labor or job efficiency, materials availability, competitive conditions, management, mechanization or other "intangibles" affecting construction costs.

- A hypothetical block of construction requiring 6 bbls of cement, 1.088 M ft bm of lumber, 2,500 lbs of steel and 200 hours of common labor is used in the Construction Cost Index to measure the trend of the cost of heavy construction.

- The Building Cost Index is based on a similar hypothetical block using the same quantities of materials, but 68.38 hours of skilled labor.

- This simple structure was adopted to facilitate prompt reporting of changes due to price and wage rate movements, both as to direction and degree.

- Both indexes have proved, over the years, infallible as to direction and, in normal times, accurate as to degree. Under abnormal conditions of increasing or decreasing job productivity, allowance for the "intangibles" listed above should be made in measuring the degree of change in overall completion costs, or of construction selling price.

- Construction volume index in constant dollars is computed by deflating the current dollar volume of engineering construction as reported by Engineering News-Record by means of the ENR Construction Cost and Building Cost Indexes.

- For definitions of other indexes shown on this chart see Engineering News-Record, November 1, 1951.

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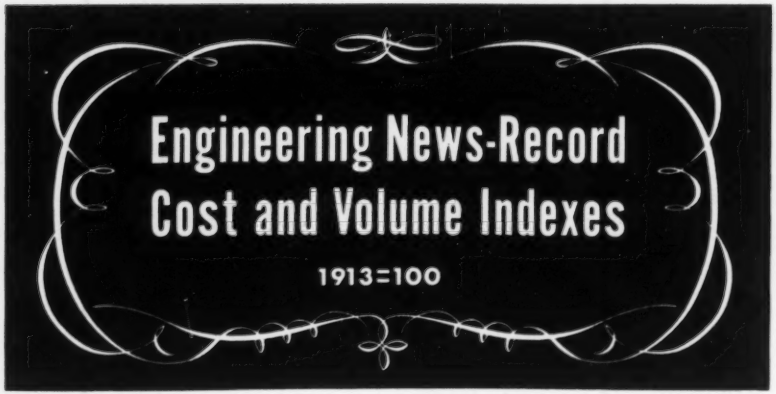


This supplement to Engineering News-Record, November 1, 1951 is part of a special survey of construction costs.

In charts and tables it shows the movement of construction costs as measured by various cost indexes.

Marshall & Stevens equipment cost indexes—1926 = 100

Industry	1950	12/50	3/51	6/51	9/51
Average of All	167.9	177.1	181.2	180.9	179.1
Commercial (aver. of 12*)	159.8	168.3	172.6	172.5	170.8
Transportation — garage	179.7	190.3	195.5	195.0	193.1
Public utility (aver. of 2*)	164.8	172.9	177.4	176.5	174.9
Process (aver. of 9*)	166.6	174.8	179.4	178.5	176.9
Food (aver. of 10*)	177.1	185.9	190.8	190.1	188.3
Metal working	166.9	174.8	179.3	178.4	176.8
Aircraft	186.1	196.7	201.9	201.4	199.5
Mach. and parts, elec. equip.	175.0	185.4	189.9	189.0	187.4
Textile	165.9	180.5	194.0	194.1	187.6
Woodworking	165.5	173.4	177.9	177.0	175.4
General (aver. of 7*)	168.2	176.9	181.5	180.9	179.1
Cold Storage — refrigerating	185.2	195.8	201.0	200.5	198.6
Contractors' equipment	166.2	174.1	178.6	177.7	176.1

*In each of these, MARSHALL AND STEVENS reports separate comparative equipment cost trends for:

Commercial: Apartment, Bank, Church, Hotel, Library, Restaurant, School, Store, Theatre, Hospital, Dwelling, Office

Public Utility: Steam Power, Electric Power

Process: Distillery, Cement, Chemical, Glass, Petroleum Industry, Paint, Paper, Rubber, Clay Products

Food: Bakery, Bottling, Brewery, Candy, Cannery-fish, Cannery-fruit, Creamery, Dairy, (Flour, cereal feed), Packing-fruit, Packing-meat

General: Laundry, Mining and Milling, Motion Picture, Printing, Shipbuilding, Warehouses, Logging

Marshall and Stevens, Inc. of Illinois, Chicago.

Comparative equipment costs, 1913 to date, developed to cover the composite of the entire plant, machinery of various kinds, mechanical installation, furniture and fixtures, hand tools and other, and combined in proper proportion to their average occurrence in each plant are computed for 47 industries. Eleven series are reproduced here, five of which are averages of 3 or more M&S related series. These are M&S estimates of actual costs paid for installed plant equipment, as a whole.

See other pages for building cost index description and chart.

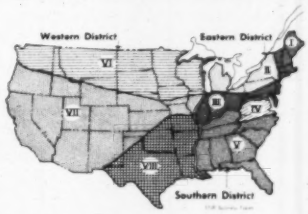
Railroad cost index

For description of these indexes see page on Other Building Cost Indexes.

Ratio of RR costs, 1950

	%
Road construction	68.40
Equipment, work	0.56
Equipment, rolling & floating	24.47
General	6.57
Total	100.00

Railroad construction cost indexes are compiled annually by Engineering Section, Bureau of Valuation, Interstate Commerce Comm.



Road Construction Cost ICC — (1910-14 = 100)

By Districts & Regions	Per Cent	1926	1932	1939	1945	1948	1949	1950
I to VIII	73.09	166	131	137	197	271	270	276
I Eastern	75.36	173	134	140	206	288	287	287
II Eastern	68.15	168	133	141	202	281	283	289
III Eastern	67.99	168	132	144	205	285	286	289
IV Southern	70.49	163	126	131	195	262	259	269
V Southern	76.66	164	129	136	195	265	265	274
VI Western	77.41	164	129	132	190	257	253	263
VII Western	75.62	166	131	133	188	258	256	265
VIII Western	78.15	167	133	140	198	270	270	274

Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.

By Accounts	1926	1932	1939	1945	1949	1950
Engineering	166	131	137	197	270	276
Other Rt. of Way Exp.	159	121	135	201	258	278
Grading	153	106	90	144	139	140
Tunnels and Subways	178	119	140	236	339	332
Brdg., Culv. & Trestles	170	122	149	240	374	364
Elevated Structures	165	129	149	249	382	380
Ties	173	144	158	241	302	306
Rails	144	140	136	152	245	264
Other Track Material	177	163	167	176	278	278
Ballast	175	146	143	181	254	258
Trk. Laying & Surf.	188	164	165	273	366	364
Fncs, Snw, Sheds, Signs	178	147	141	189	279	298
Stat. & Off. Bldgs.	184	141	166	244	368	390
Roadway Bldgs.	187	140	162	258	386	398
Water Stations	152	147	166	227	327	340
Fuel Stations	180	144	159	242	357	368
Shops & Eng. Houses	185	137	165	248	379	397
Grain Elevators	190	137	164	236	367	388
Storage Warehouses	189	137	166	253	377	402
Wharves & Docks	177	136	153	255	350	363
Coal & Ore Wharves	174	136	153	236	341	348
Tel. & Tel. Lines	157	121	129	173	250	270
Signals & Interlocks	169	130	143	176	226	242
Power Plants	186	138	167	246	386	407
Power Trnsmissn. Sys.	176	143	148	180	266	289
Misc. Structures	186	141	161	229	378	399
Roadway Machines	151	138	154	187	270	285
Roadway Small Tools	190	155	180	200	315	353
Public Impr. Const.	169	131	142	217	321	316
Shop Machinery	186	155	202	236	324	346
Power Plant Mach.	186	155	180	191	242	262
Work equipment	180	165	200	254	348	365

Handy-Whitman Index — public utility construction costs

Compiled and published semi-annually by Whitman, Requardt and Associates, Baltimore, Md.

Building construction — 1911 to 1914 = 100

(Complete Index reports 14 items entering into Building Construction Costs.)

	Jan. '50	July '50	Jan. '51	July '51
North Atlantic Division				
Reinf conc bldg.	437	448	473	479
Brick bldg.	424	436	460	474
South Atlantic Division				
Reinf conc bldg.	465	469	491	510
Brick bldg.	434	439	456	485
North Central Division				
Reinf conc bldg.	423	437	463	468
Brick bldg.	394	408	433	440
South Central Division				
Reinf conc bldg.	418	422	445	454
Brick bldg.	387	392	408	424
Plateau Division				
Reinf conc bldg.	400	417	435	451
Brick bldg.	396	410	427	442
Pacific Division				
Reinf conc bldg.	420	432	458	463
Brick bldg.	389	400	419	435

Handy-Whitman, Whitman, Requardt & Associates, Baltimore, Md.—Individual series for 95 cost elements in three classes of utility construction, for six geographic divisions of the United States, are reported semi-annually. Weighting is based on wide experience in cost analysis of plants and construction. Material prices from ENGINEERING NEWS-RECORD, Iron Age and various manufacturers; labor rates from utilities, unions and builders associations. 1911 = 100 and 1911-14 = 100 are both used as bases.

The series shown on the accompanying charts is for reinforced concrete buildings in the Pacific Division.

Gas plant construction—1911 = 100

(Complete Index reports 17 items entering into Gas Plant Construction Costs.)

	Jan. '50	July '50	Jan. '51	July '51
North Atlantic Division				
Tot constr & equip.	467	476	514	519
Mech equip, excl gas hldr	479	485	549	549
South Atlantic Division				
Tot constr & equip.	456	457	492	507
Mech equip, excl gas hldr	479	485	549	549
North Central Division				
Tot constr & equip.	437	447	481	489
Mech equip, excl gas hldr	479	485	549	549
South Central Division				
Tot constr & equip.	425	429	465	470
Mech equip, excl gas hldr	479	485	549	549
Plateau Division				
Tot constr & equip.	401	405	440	449
Mech equip, excl gas hldr	479	485	549	549
Pacific Division				
Tot constr & equip.	433	437	475	480
Mech equip, excl gas hldr	479	485	549	549

Electric light and power construction—1911 = 100

(Complete Index reports 64 items entering into Electric Light and Power Construction Costs.)

	Jan. '50	July '50	Jan. '51	July '51
North Atlantic Division				
Tot constr & equip*	399	409	462	468
Acces elect equip†	341	360	413	420
Sub-sta equip	312	320	352	359
South Atlantic Division				
Tot constr & equip*	422	430	482	490
Acces elect equip†	358	374	426	431
Sub-sta equip	327	333	365	370
North Central Division				
Tot constr & equip*	374	382	436	433
Acces elect equip†	310	324	376	382
Sub-sta equip	282	286	320	326
South Central Division				
Tot constr & equip*	390	398	448	454
Acces elect equip†	340	357	407	415
Sub-sta equip	311	319	344	352
Plateau Division				
Tot constr & equip*	376	386	436	443
Acces elect equip†	323	341	390	399
Sub-sta equip	294	302	332	341
Pacific Division				
Tot constr & equip*	379	389	440	450
Acces elect equip†	323	343	394	408
Sub-sta equip	297	307	342	357

*Steam plant only.
†Formerly called "Electric Plant-Steam."

Boeckh index of building costs—US average 1926-'29=100

Annual Averages By Cities	Residences Frame	Residences Brick	Apartments, Hotels, Office Bldgs. Brick and Wood	Apartments, Hotels, Office Bldgs. Brick and Conc.	Apartments, Hotels, Office Bldgs. Brick and Steel	Commercial & Factory Bldgs. Brick and Frame	Commercial & Factory Bldgs. Brick and Steel	Commercial & Factory Bldgs. Brick and Wood	Commercial & Factory Bldgs. Brick and Steel	Commercial & Factory Bldgs. Brick and Conc.
U. S. AVERAGE — These major pricing areas*										
1950	225.9	227.1	226.7	216.5	217.0	231.3	203.2	222.2	217.4	218.8
Dec. '50	236.1	237.4	236.9	224.7	226.4	241.3	211.0	232.4	225.9	226.3
Mar. '51	242.3	243.7	243.3	230.5	232.6	247.7	218.4	238.7	232.6	232.1
June '51	243.4	245.1	244.9	233.2	234.6	248.7	220.2	240.5	234.9	233.0
July '51	242.5	244.6	244.2	233.4	234.6	247.7	220.5	240.2	235.1	235.4
ATLANTA AREA*										
1950	196.2	194.3	194.7	185.4	191.0	199.3	183.0	190.0	185.0	183.7
Dec. '50	208.0	205.4	205.7	195.3	200.3	211.2	193.3	200.0	195.3	192.0
Mar. '51	214.4	212.8	212.9	203.0	210.2	218.1	200.7	207.7	202.7	201.6
July '51	213.4	211.9	212.4	204.8	212.0	216.4	208.1	207.5	206.6	203.6
BALTIMORE AREA*										
1950	231.0	231.8	232.1	215.0	216.8	234.9	204.2	230.6	217.7	216.5
Dec. '50	240.6	241.8	242.3	222.2	225.6	244.2	212.1	241.1	225.9	223.1
Mar. '51	245.3	246.2	246.7	225.2	229.3	248.9	215.4	245.4	229.1	225.6
July '51	246.2	248.4	249.0	230.3	232.5	248.7	218.0	248.7	232.5	232.1
BIRMINGHAM AREA*										
1950	196.3	196.1	196.8	186.6	189.4	200.6	179.2	193.9	186.2	187.6
Dec. '50	208.6	208.0	207.9	196.4	200.1	212.1	187.2	205.1	195.5	197.4
Mar. '51	213.1	211.9	211.6	200.6	204.6	217.2	192.4	208.4	199.4	200.8
July '51	212.9	212.5	212.5	200.3	204.5	216.4	191.7	210.4	199.9	200.2
BOSTON AREA*										
1950	234.6	240.8	236.8	227.3	225.5	240.3	210.9	231.8	229.8	232.5
Dec. '50	244.8	248.0	247.2	236.5	236.0	250.9	219.3	242.0	239.6	241.2
Mar. '51	250.6	254.3	253.7	241.4	241.5	255.9	226.7	249.5	246.1	245.9
July '51	253.4	257.1	256.3	244.9	244.5	258.5	228.3	252.2	247.9	249.0
CHICAGO AREA*										
1950	231.9	229.7	227.4	217.8	216.8	243.4	201.2	216.5	219.5	222.6
Dec. '50	241.2	238.5	236.2	226.5	225.8	252.7	208.5	224.2	226.7	229.4
Mar. '51	246.5	242.8	240.6	228.7	229.1	258.8	211.7	227.5	229.9	230.9
July '51	248.3	246.4	243.9	237.0	235.3	260.6	218.2	231.9	237.6	241.1
CINCINNATI AREA*										
1950	220.3	224.1	223.1	213.9	211.7	224.3	199.1	220.4	215.6	218.7
Dec. '50	229.7	234.4	233.2	221.2	219.6	233.3	204.6	233.2	222.7	226.1
Mar. '51	235.9	240.9	239.9	226.1	225.3	238.8	210.7	240.8	228.6	230.1
July '51	238.6	243.3	242.7	231.0	230.2	241.3	214.8	243.7	233.2	234.0
CLEVELAND AREA*										
1950	237.9	237.8	235.4	227.8	224.1	248.1	207.2	227.6	228.4	232.3
Dec. '50	247.2	247.3	245.1	235.5	233.2	257.0	216.2	237.8	237.2	239.3
Mar. '51	256.3	256.4	253.7	244.1	241.3	267.1	221.8	245.5	245.0	248.4
July '51	254.1	254.7	252.0	243.7	240.7	264.6	221.6	244.3	244.5	248.2
DALLAS AREA*										
1950	220.5	221.2	222.1	209.0	212.5	221.3	206.3	218.6	210.1	208.3
Dec. '50	232.1	232.0	232.6	219.3	224.2	234.3	217.6	227.8	221.0	217.8
Mar. '51	236.1	236.5	238.1	226.1	231.9	237.7	235.8	232.6	232.6	224.4
July '51	236.2	236.4	237.8	226.5	231.8	238.0	235.8	232.4	232.7	224.3
DENVER AREA*										
1950	228.2	230.0	229.8	218.8	221.2	232.4	212.3	226.2	221.2	221.3
Dec. '50	243.2	246.0	245.8	230.6	233.9	245.7	219.6	243.5	232.4	231.1
Mar. '51	247.1	249.6	249.5	234.9	238.8	249.7	227.5	246.7	237.6	235.2
July '51	245.1	249.0	248.7	237.4	240.4	247.4	229.7	246.8	240.3	239.1
DETROIT AREA*										
1950	233.0	234.0	233.3	222.8	222.0	240.0	208.2	227.1	226.0	225.7
Dec. '50	242.6	243.6	242.6	230.5	230.5	249.7	213.8	236.5	232.5	233.0
Mar. '51	249.9	250.8	249.7	237.6	237.5	258.2	221.6	242.6	241.1	240.7
July '51	249.9	250.9	249.8	238.2	238.0	257.7	221.7	242.5	241.2	240.8
KANSAS CITY AREA*										
1950	230.5	229.6	228.7	216.0	218.8	238.1	203.6	219.6	217.7	217.8
Dec. '50	241.5	242.3	241.6	226.0	229.6	247.4	212.6	234.8	228.4	227.5
Mar. '51	245.7	245.9	245.4	228.5	233.0	252.0	217.2	237.7	231.7	229.5
July '51	249.6	250.3	249.5	234.2	236.9	256.0	219.9	241.9	235.9	236.0
LOS ANGELES AREA*										
1950	222.8	224.1	223.4	217.4	219.2	227.8	205.5	215.4	217.5	219.0
Dec. '50	231.9	233.1	232.4	225.3	228.6	237.2	214.8	224.5	226.4	226.4
Mar. '51	241.3	242.0	241.3	234.8	238.1	247.8	224.5	232.1	236.4	235.5
July '51	238.8	239.9	239.2	235.2	237.3	244.0	224.7	231.9	236.7	237.8
MINNEAPOLIS AREA*										
1950	228.2	227.9	227.0	210.1	213.2	234.4	198.2	220.3	215.6	211.3
Dec. '50	236.8	236.2	235.6	215.9	220.9	242.9	205.3	228.7	219.3	216.1
Mar. '51	243.1	242.7	242.3	220.9	226.3	248.4	211.2	236.0	224.8	221.0
July '51	247.0	248.0	247.3	230.5	233.2	252.3	217.3	241.4	233.3	232.0
NEW ORLEANS AREA*										
1950	211.7	210.3	211.0	196.2	203.1	215.8	194.4	206.4	199.5	195.3
Dec. '50	221.4	219.2	219.8	203.2	210.9	226.3	201.3	214.1	206.3	201.4
Mar. '51	225.9	223.9	224.5	207.3	214.1	230.0	205.8	219.6	210.5	205.8
July '51	225.8	224.1	224.9	208.2	216.7	229.8	206.1	220.0	211.3	206.1
NEW YORK CITY AREA*										
1950	254.5	256.2	255.2	249.5	246.1	262.1	224.2	249.7	248.0	251.5
Dec. '50	266.5	268.1	267.1	258.5	255.9	273.6	232.1	261.3	257.2	259.9
Mar. '51	271.7	273.5	272.6	262.7	260.7	278.5	238.1	267.2	262.3	263.8
July '51	269.8	272.3	271.2	264.5	261.4	275.9	240.3	266.6	263.2	266.3
PHILADELPHIA AREA*										
1950	234.4	235.1	234.8	221.2	220.7	239.3	202.0	230.5	218.8	222.8
Dec. '50	244.8	246.1	246.0	230.4	230.9	248.6	211.4	243.0	229.0	231.7
Mar. '51	251.3	251.2	250.9	234.3	234.9	255.8	215.3	246.9	232.4	234.6
July '51	249.3	250.0	249.8	235.3	235.6	253.7	216.6	246.3	233.8	235.8
PITTSBURGH AREA*										
1950	237.6	238.6	237.6	222.2	219.8	242.6	196.6	235.3	218.9	224.2
Dec. '50	246.2	246.3	245.4	228.8	228.3	252.0	204.1	241.4	226.4	229.4
Mar. '51	254.3	254.7	253.7	236.3	235.7	260.6	211.9	249.8	235.0	237.1
July '51	252.5	253.4	252.4	236.5	235.7	258.0	211.8	248.6	234.8	236.9
ST. LOUIS AREA*										
1950	230.7	232.8	233.7	221.9	220.9	240.1	204.7	229.5	222.8	225.3
Dec. '50	239.7	243.0	244.6	229.9	229.5	249.6	210.2	241.1	229.9	233.3
Mar. '51	245.4	249.0	250.9	232.5	234.0	254.7	213.1	248.2	234.9	236.3
July '51	247.3	251.6	253.6	240.3	238.5	258.5	219.1	251.0	240.7	243.2
SAN FRANCISCO AREA*										
1950	223.1	227.0	226.8	222.4	222.9	226.1	209.1	224.5	222.6	224.5
Dec. '50	232.0	235.2	234.9	228.4	230.5	235.4	215.8	232.0	228.9	229.5
Mar. '51	238.7	242.9	242.8	237.2	238.9	242.9	231.3	240.0	241.1	240.8
July '51	240.2	245.7	245.7	240.3	241.2	243.4	232.3	244.7	244.2	244.1
SEATTLE AREA*										
1950	213.6	224.1	224.0	227.1	224.7	214.3	214.1	227.8	230.3	234.5
Dec. '50	222.3	232.5	232.6	234.3	233.3	222.2	220.1	235.4	236.8	240.3
Mar. '51	232.7	245.0	245.0	246.3	244.1	232.1	231.6	250.1	249.9	254.2
July '51	232.8	245.6	245.3	249.4	245.8	232.5	233.2	251.2	252.4	257.8
WASHINGTON, D. C.										
1950	235.0	233.7	233.8	223.2	224.5	240.5	210.2	227.5	223.8	222.0
Dec. '50	246.6	244.2	244.5	229.6	232.7	252.5	216.1	237.2	230.3	227.3
Mar. '51	251.7	249.5	250.0	233.8	237.7	257.3	224.2	243.0	236.5	231.0
July '51	251.4	250.3	250.6	236.3	239.2	257.1	226.1	243.9	239.5	234.9

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BPR highway price index — composite standard mile

U. S. Bureau of Public Roads, 1925-29 = 100

Year	Excavation[1] 17,491 cy* Bid	Excavation[1] 17,491 cy* Sub-Index	Surfacing[2] 3,726 sy* Bid price[3]	Surfacing[2] 3,726 sy* Sub-Index	Structures: Reinf. steel 16,000 lb.* Bid price[3]	Structures: Struct. steel 4,325 lb.* Bid price[3]	Structures: Struct. concr. 68 cy* Bid price[3]	Structures: Comb Sub-Index	Composite mile Index
'25-29	$.035†	100.0	$2.22†	100.0	$0.052†	$0.067†	$22.15†	100.0	100.0
1Q	.32	91.2	3.54	159.6	0.096	0.133	44.96	197.0	140.7
2Q	.32	91.2	3.55	160.1	0.096	0.133	42.61	191.0	140.0
1950	.34	96.8	3.66	164.9	0.100	0.139	44.62	199.4	145.7
3Q	.34	96.9	3.68	165.9	0.100	0.137	44.66	199.4	146.2
4Q	.38	107.7	3.86	174.0	0.106	0.154	46.25	210.0	155.7
1951									
1Q	.38	109.1	3.88	174.9	0.116	0.180	50.12	230.4	159.7
2Q	.40	114.5	3.86	174.0	0.119	0.170	51.45	234.0	161.8

*[1] Common excav. plus other excav. items expressed as equivalent common excav. *[2] Portland-cmt. concr. plus other surfacing expressed as equivalent portland-cmt. concr. *[3] Calculated to one more decimal place than shown in this table. **Fixed quantities used for establishing composite mile for price trend. *†Prices used for establishing composite mile index base.

California highway price index and average contract prices

Division of Highways, State of California — 1940 = 100

Year	Roadway Excavation Per Cy	Crush-er Run Base Per T	Plant Mix Surface Per T	Asph. Conc. Pave. Per T	PCC Pavement Per Cy	PCC Structures Per Cy	Bar Reinf Steel Per Lb	Structural Steel Per Lb	Hwy. Constr. Price Index
1940*	$0.22	$1.54	$3.19	$2.97	$7.68	$18.33	$0.040	$0.083	100.0
'50 1 Q*	0.34	2.22	3.65	3.74	....	40.15	0.077	0.081	160.0
'50 2 Q*	0.40	2.13	4.48	3.74	10.86	43.03	0.080	0.105	180.0
'50 3 Q*	0.41	2.32	4.25	3.50	10.91	44.34	0.093	0.131	189.2
'50 4 Q*	0.42	2.81	4.64	4.61	12.55	43.18	0.098	0.120	194.8
'51 1 Q*	0.45	3.07	4.06	5.22	11.71	46.38	0.103	0.206	215.4
'51 2 Q*	0.63	3.88	4.56	4.63	12.93	51.50	0.105	0.166	238.3

*All projects.

CALIFORNIA'S highway construction price index is based on the average contract prices for the eight principal classes of construction shown in the accompanying table. The index is weighted each year according to the actual quantities of each of these contract items. The base is 1940 = 100, 1940 quantities multiplied by 1940 average contract prices. The price index for each period is computed by extending total quantities.

Average number of bidders per project California Division of Highways

	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Year
1949-50	6.5	7.2	8.0	7.0	9.5	10.8	9.3	8.3	8.2	7.5	6.1	5.2	7.3
1950-51	4.9	5.6	5.8	6.2	6.7	5.7	5.5	5.3	4.8	4.7	3.7	3.2	5.0

Number of bidders by size of project, July 1, 1950-June 30, 1951

Size of project	Roads Number of proj.	Roads bidders	Structures Number of proj.	Structures bidders	Combination Number of proj.	Combination bidders	All Number of proj.	All bidders
Up to $50,000	154	4.1	52	4.3	..	..	206	4.1
$50,000 to $100,000	39	5.4	14	6.5	..	..	53	5.7
$100,000 to $250,000	53	5.7	13	4.7	..	..	66	5.5
$250,000 to $500,000	15	5.8	13	5.8	..	..	28	5.8
$500,000 to $1,000,000	21	7.5	5	8.6	..	..	26	7.7
Over $1,000,000	7	6.0	4	5.0	7	5.3	18	5.6
All projects	289	4.9	101	5.1	7	5.3	397	5.0

Engineering News-Record CONSTRUCTION COST INDEX, 1913=100

Components of Construction Cost Index and weighting: 25 cwt structural steel shapes, base mill price; 6 bbl portland cement, 20-cities average, bulk; 1.088 Mfbm 2x4, S4S lumber, 20-cities average; 200 hr common labor, 20-cities average.

Years 1903-1913 **1903** 93.90 **1904** 87.40 **1905** 90.55 **1906** 95.10 **1907** 100.55 **1908** 97.20 **1909** 90.92 **1910** 96.33 **1911** 93.43 **1912** 90.70 **1913** 100.00

Mo-Yr	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	Yr-Mo
Jan	89.22	87.12	112.66	167.75	184.51	198.05	206.55	230.87	168.72	191.70	217.90	210.40	207.15	211.50	203.90	209.40	208.96	194.48	162.48	Jan
Feb	89.22	87.36	116.66	167.75	184.51	201.50	225.10	230.67	168.72	197.40	220.30	209.70	206.55	210.15	204.65	210.40	206.46	196.61	161.82	Feb
Mar	88.97	87.66	125.16	175.66	184.51	198.05	240.85	224.27	162.04	205.25	224.70	210.20	207.65	208.80	204.65	207.78	206.80	194.51	157.24	Mar
Apr	87.97	90.16	129.51	183.41	186.01	191.25	265.20	213.07	164.72	213.50	221.60	209.55	207.05	209.00	206.40	203.40	207.12	191.63	153.12	Apr
May	88.62	90.16	131.06	187.61	186.01	191.25	268.90	210.82	164.62	216.70	222.38	207.20	207.30	206.80	207.00	205.15	205.86	189.33	152.78	May
Jun	87.87	88.96	128.71	199.26	186.31	191.85	273.80	209.82	166.62	220.70	216.85	204.60	204.80	205.55	206.15	205.65	203.36	187.23	152.20	Jun
Jul	88.12	90.51	127.96	204.01	188.65	193.65	265.65	203.82	169.70	222.10	214.40	204.60	207.80	203.68	206.65	204.77	200.95	174.37	153.36	Jul
Aug	90.11	91.76	128.76	198.41	193.85	196.65	252.00	193.47	173.40	221.50	213.15	204.60	208.30	205.50	207.29	205.91	200.95	171.38	156.80	Aug
Sep	90.36	93.01	131.76	190.31	193.85	202.85	255.20	188.27	185.00	221.50	211.25	202.10	208.30	203.60	207.29	207.57	199.58	171.40	157.96	Sep
Oct	88.51	96.16	135.11	167.11	193.85	202.25	255.20	182.57	188.60	220.30	207.55	205.35	209.80	204.40	207.71	206.32	198.72	169.78	159.16	Oct
Nov	87.26	101.06	138.16	166.51	193.55	206.85	255.32	166.32	188.60	220.90	205.70	205.95	210.80	201.98	209.46	208.46	198.54	169.28	158.20	Nov
Dec	86.51	107.06	149.41	167.11	194.75	206.85	251.62	167.82	192.60	217.90	208.58	205.95	210.80	203.90	210.16	209.46	196.86	166.23	158.46	Dec
Av	**88.56**	**92.58**	**129.58**	**181.24**	**189.20**	**198.42**	**251.28**	**201.82**	**174.45**	**214.12**	**215.36**	**206.68**	**208.03**	**206.24**	**206.78**	**207.02**	**202.85**	**181.35**	**156.97**	**Av**

Mo-Yr	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	Yr-Mo
Jan	158.44	191.26	198.22	201.23	221.20	239.62	234.72	238.34	249.69	267.63	283.45	294.57	302.50	316.32	386.97	441.65	477.41	484.74	531.93	Jan
Feb	159.30	194.06	195.07	201.33	222.05	238.99	234.31	238.32	250.50	269.41	283.48	295.05	303.70	319.52	393.73	442.67	475.37	484.85	538.00	Feb
Mar	158.44	194.06	194.41	201.63	224.75	238.79	234.43	238.29	250.71	269.71	285.24	295.34	304.50	323.83	395.45	443.60	474.80	488.35	539.23	Mar
Apr	160.16	195.86	194.65	202.80	231.35	237.95	234.86	238.26	252.40	271.78	288.80	297.70	306.43	334.59	399.56	443.64	474.34	491.94	539.97	Apr
May	164.39	199.61	193.96	204.05	233.45	236.80	234.69	238.86	255.55	272.30	289.87	298.00	307.43	339.69	399.98	444.86	472.10	496.55	542.93	May
Jun	163.41	199.61	196.73	205.08	237.25	236.86	235.02	241.59	256.79	274.19	289.94	298.72	308.99	348.72	406.63	455.80	473.78	506.88	542.68	Jun
Jul	165.50	199.65	197.43	204.80	239.90	232.29	234.94	242.15	258.18	277.65	289.92	299.94	308.99	354.70	413.75	464.83	477.46	512.67	542.36	Jul
Aug	167.00	198.40	197.45	208.48	240.65	232.39	234.90	242.18	260.41	281.61	291.38	300.42	309.08	361.37	422.85	477.11	478.28	521.36	542.78	Aug
Sep	175.48	200.58	197.30	208.88	241.62	232.70	234.97	244.13	263.12	281.61	294.09	300.46	309.28	360.19	426.38	478.40	479.78	530.37	542.61	Sep
Oct	187.74	200.86	197.50	211.53	241.90	234.30	236.86	245.02	264.46	282.44	294.31	301.06	309.28	360.94	434.58	480.21	480.54	535.63	546.48	Oct
Nov	190.14	201.36	197.35	211.50	241.40	234.40	238.20	247.24	266.13	283.64	294.41	301.09	309.28	362.47	436.91	478.25	480.02	529.04	.....	Nov
Dec	192.14	201.86	197.20	215.70	241.05	234.89	238.17	249.12	266.16	283.69	294.51	302.30	313.48	369.30	441.13	477.66	480.32	530.03	.....	Dec
Av	**170.18**	**198.10**	**196.44**	**206.42**	**234.71**	**235.83**	**235.51**	**241.96**	**257.84**	**276.30**	**289.95**	**298.72**	**307.75**	**345.98**	**413.24**	**460.72**	**477.02**	**509.37**	.....	**Av**

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Engineering News-Record BUILDING COST INDEX, 1913=100

Components of Building Cost Index and weighting: 25 cwt structural steel shapes, base mill price; 6 bbl portland cement, 20-cities average, bulk; 1.088 Mfbm 2x4 S4S lumber, 20-cities average; 68.38 hr skilled labor, 20-cities average.

Year	Index	Mo-Yr	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	Yr-Mo
1913	100.00	Jan	147.12	168.20	189.30	182.70	183.94	187.80	185.90	190.00	190.30	180.70	150.60	140.82	160.15	166.50	Jan
1914	91.91	Feb	146.47	172.55	191.70	184.50	183.65	189.15	187.15	190.00	188.50	181.95	147.20	141.70	161.30	165.75	Feb
1915	95.28	Mar	145.19	178.40	194.10	184.50	184.25	187.30	187.15	190.00	189.20	180.19	145.88	140.80	161.70	164.10	Mar
1916	130.88	Apr	147.12	186.00	191.80	184.65	184.05	186.00	188.80	190.00	188.80	177.55	135.68	141.50	163.15	164.40	Apr
1917	166.79	May	149.02	188.90	192.48	182.80	183.55	185.40	190.10	191.25	187.90	174.55	136.38	143.85	168.15	163.30	May
1918	159.10	Jun	149.77	191.30	187.65	183.00	181.80	185.75	187.55	191.95	185.40	169.65	137.58	143.20	168.15	164.85	Jun
1919	158.77	Jul	150.85	191.40	184.50	182.71	184.30	183.88	187.55	191.95	183.25	164.05	139.48	144.30	169.15	165.25	Jul
1920	207.23	Aug	154.55	191.50	183.25	183.00	185.10	186.50	187.55	192.75	183.65	160.10	139.40	145.90	168.40	166.20	Aug
1921	166.05	Sep	164.15	192.20	181.35	180.50	185.10	184.60	187.55	191.55	182.40	159.50	139.60	154.50	170.10	166.05	Sep
1922	154.85	Oct	167.75	191.00	178.35	181.75	187.95	186.60	187.55	190.30	181.80	158.10	140.00	157.05	170.20	167.30	Oct
1923	185.98	Nov	167.08	192.35	176.50	182.35	187.95	184.98	188.80	190.30	181.80	157.40	139.50	159.00	170.20	167.30	Nov
1924	185.78	Dec	169.10	188.00	178.38	183.05	187.95	185.10	190.00	190.30	181.80	154.15	140.00	160.70	170.20	167.15	Dec
1925	**182.93**	**Av**	**154.85**	**185.98**	**185.78**	**182.93**	**184.96**	**186.09**	**187.97**	**190.86**	**185.40**	**168.10**	**140.94**	**147.78**	**166.74**	**165.76**	**Av**

Mo-Yr	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	Yr-Mo
Jan	168.25	185.45	198.62	196.24	201.52	207.94	217.12	226.87	231.55	236.51	242.23	294.62	333.58	354.98	356.23	392.99	Jan
Feb	168.43	186.55	198.99	196.23	201.50	208.42	218.44	226.90	232.03	237.71	243.94	301.56	335.49	352.94	356.48	398.21	Feb
Mar	169.68	187.65	199.29	196.46	201.47	207.88	218.88	226.66	232.32	237.85	245.41	303.28	334.22	352.54	359.98	399.32	Mar
Apr	170.00	194.95	198.21	196.45	201.44	208.60	219.55	227.50	234.50	238.46	254.37	305.21	334.56	351.42	362.78	400.06	Apr
May	170.35	197.15	197.86	196.60	201.17	209.24	220.14	227.64	234.80	238.46	258.06	304.64	333.93	348.92	364.27	401.10	May
Jun	170.18	199.20	198.22	196.41	201.65	209.41	221.18	227.71	235.33	239.37	265.28	307.42	339.26	349.28	373.39	400.75	Jun
Jul	170.85	199.80	194.39	196.78	201.68	210.22	223.45	227.89	235.55	239.64	267.25	308.90	342.42	349.46	377.66	400.36	Jul
Aug	173.93	200.65	194.49	196.54	201.71	212.45	225.39	228.49	236.09	239.94	272.29	317.75	355.45	350.85	383.12	400.07	Aug
Sep	174.33	200.62	194.80	196.61	203.13	214.58	225.46	231.20	236.00	240.07	272.37	322.58	356.70	351.98	392.81	399.90	Sep
Oct	175.33	201.00	195.48	198.50	204.02	215.92	225.90	231.29	236.00	240.35	273.01	327.29	357.07	353.02	397.42	403.40	Oct
Nov	175.50	200.30	195.58	201.24	206.24	216.54	226.58	231.39	236.10	240.55	273.99	329.22	355.86	352.91	390.04	.....	Nov
Dec	179.30	200.45	196.07	201.21	208.19	216.37	226.63	231.49	236.51	240.82	279.97	333.06	355.55	353.21	391.44	.....	Dec
Av	**172.18**	**196.15**	**196.83**	**197.44**	**202.81**	**211.46**	**222.39**	**228.75**	**234.73**	**239.14**	**262.25**	**312.96**	**344.51**	**351.79**	**375.47**	.....	**Av**

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ENR CONSTRUCTION COST INDEX, in 21 cities, 1913=100

Components of Construction Cost Index and weighting in U.S. cities are: 25 cwt structural steel shapes, base mill price; 6 bbl portland cement, bulk, 1.088 Mfbm 2x4, 545 lumber, 200 hr common labor, at local prices. In Montreal, warehouse price of steel has to be used, so 15 cwt is weighting for steel. Price of Canadian steel is used prior to Oct. 1949 — and the average of Canadian and U.S. steel prices is used after devaluation of Canadian dollar in Oct. 1949. Cement weighting is 10 bbl. Other elements are same as for U.S. cities.

	1948		1949				1950				1951				
21 Cities	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	21 Cities
Atlanta	324.83	344.83	344.83	344.83	344.83	345.13	353.88	353.88	394.00	389.79	394.79	394.85	394.85	.....	Atlanta
Baltimore	462.21	462.21	462.21	424.68	424.32	424.07	427.01	461.97	478.83	473.99	485.74	487.57	481.85	.....	Baltimore
Birmingham	378.45	379.29	379.29	389.29	389.29	377.32	380.71	380.71	387.51	413.49	416.21	416.21	416.21	.....	Birmingham
Boston	513.37	507.94	507.09	526.00	525.46	532.35	536.10	556.10	570.24	562.95	575.52	586.04	590.36	.....	Boston
Chicago	537.17	530.36	527.09	526.01	540.57	542.05	549.60	583.53	606.56	593.33	603.43	597.99	620.18	.....	Chicago
Cincinnati	505.13	505.13	489.65	486.87	496.10	496.16	501.87	510.03	568.17	552.80	559.47	556.20	543.15	.....	Cincinnati
Cleveland	535.35	522.59	520.42	514.19	524.61	530.03	537.44	577.98	605.18	587.25	607.01	604.83	596.53	.....	Cleveland
Dallas	397.73	397.73	397.73	397.74	394.47	396.65	422.00	422.90	422.90	438.16	437.22	437.22	437.22	.....	Dallas
Denver	498.93	495.67	481.53	481.56	469.56	469.56	490.54	505.95	540.53	527.52	552.35	557.79	564.09	.....	Denver
Detroit	510.71	499.72	501.11	488.67	514.23	514.50	520.70	554.68	583.24	591.98	592.49	601.74	601.05	.....	Detroit
Kansas City	499.94	499.94	484.44	501.00	511.27	511.27	528.26	550.27	570.90	569.69	569.99	575.43	585.99	.....	Kansas City
Los Angeles	510.95	494.63	482.06	478.19	489.15	493.51	511.40	528.81	552.42	537.39	579.87	572.26	558.11	.....	Los Angeles
Minneapolis	512.19	510.02	503.67	503.67	512.23	512.47	516.22	537.98	554.90	561.75	556.91	586.91	586.91	.....	Minneapolis
New Orleans	349.98	354.45	379.45	379.45	378.85	378.85	382.60	402.26	407.70	412.37	441.20	439.30	434.46	.....	New Orleans
New York	549.17	541.24	536.50	533.86	533.32	538.61	546.44	575.00	620.44	610.97	618.37	615.76	609.21	.....	New York
Philadelphia	469.53	466.68	461.61	491.61	516.61	514.53	518.28	541.00	555.96	574.78	575.38	575.38	582.38	.....	Philadelphia
Pittsburgh	469.74	501.85	501.85	492.19	492.19	492.19	497.30	498.66	532.26	528.77	531.49	531.49	551.49	.....	Pittsburgh
St. Louis	542.15	542.15	526.72	507.52	524.12	521.96	528.82	551.63	579.23	569.07	585.28	596.89	583.88	.....	St. Louis
San Francisco	490.08	483.55	478.11	478.11	483.17	483.17	485.83	494.54	513.04	519.29	517.83	533.27	525.11	.....	San Francisco
Seattle	511.71	511.71	529.55	529.55	529.55	530.15	533.90	547.50	563.82	563.11	585.51	585.51	592.51	.....	Seattle
Montreal	406.02	408.27	407.18	407.88	395.88	393.59	396.59	396.59	428.09	427.19	445.14	472.86	483.73	.....	Montreal

ENR BUILDING COST INDEX, in 21 cities, 1913=100

Components of Building Cost Index and weighting in U.S. cities are: 25 cwt structural steel shapes, base mill price; 6 bbl portland cement, bulk, 1.088 Mfbm 2x4 545 lumber, 68.38 hr skilled labor, at local prices. In Montreal steel weighting is 15 cwt and cement, 10 bbl. Other elements are same as for U.S. cities.

	1948		1949				1950				1951				
21 Cities	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	Mar	June	Sept	Dec	21 Cities
Atlanta	302.13	307.88	307.88	307.88	309.25	312.69	316.44	316.44	339.44	338.65	338.65	338.71	338.71	.....	Atlanta
Baltimore	375.15	386.58	386.58	349.05	354.36	350.69	353.63	374.54	391.40	386.56	398.31	403.44	397.72	.....	Baltimore
Birmingham	319.79	320.63	326.31	328.56	329.73	319.12	321.15	321.15	327.95	345.00	350.87	350.87	350.87	.....	Birmingham
Boston	362.90	357.47	356.62	361.82	361.28	371.59	375.34	378.76	395.77	391.90	404.47	406.78	412.26	.....	Boston
Chicago	360.12	353.31	350.04	348.96	351.52	353.00	360.55	380.77	403.80	390.57	400.57	395.23	402.77	.....	Chicago
Cincinnati	373.82	373.82	358.34	355.56	361.77	361.83	360.14	368.30	406.25	392.04	399.87	397.70	395.04	.....	Cincinnati
Cleveland	351.59	338.83	336.66	331.59	341.93	348.51	355.92	378.61	405.81	387.88	402.31	400.13	391.43	.....	Cleveland
Dallas	322.26	322.26	322.26	322.27	316.20	318.38	322.13	323.03	323.03	338.29	361.72	361.72	370.81	.....	Dallas
Denver	368.69	365.43	351.29	351.32	358.67	358.67	377.65	395.06	422.64	399.63	425.56	432.16	423.46	.....	Denver
Detroit	357.56	346.57	347.96	335.53	350.73	351.00	357.20	375.89	404.45	400.02	401.63	410.88	410.19	.....	Detroit
Kansas City	366.19	367.19	351.69	356.69	356.96	356.96	373.95	389.88	410.01	405.51	405.81	411.25	416.75	.....	Kansas City
Los Angeles	367.82	355.74	343.17	339.30	335.71	340.07	359.80	379.81	392.00	376.97	403.08	395.47	381.32	.....	Los Angeles
Minneapolis	369.75	367.58	361.23	361.23	360.85	363.35	377.10	388.86	405.78	412.63	411.79	420.85	423.38	.....	Minneapolis
New Orleans	302.15	309.50	325.43	325.43	324.83	324.83	328.58	340.08	345.52	350.19	379.02	377.12	378.78	.....	New Orleans
New York	402.68	394.76	400.27	397.63	397.09	402.38	410.21	438.77	463.50	458.61	466.01	463.40	456.85	.....	New York
Philadelphia	393.89	391.05	385.98	394.18	394.18	392.10	397.22	414.85	429.81	448.63	449.23	449.23	455.52	.....	Philadelphia
Pittsburgh	376.36	384.22	384.22	374.56	374.56	377.36	382.47	387.25	400.85	397.36	400.08	400.08	405.21	.....	Pittsburgh
St. Louis	385.22	390.97	385.54	375.34	378.90	376.73	383.60	396.41	430.78	420.62	432.03	435.50	422.49	.....	St. Louis
San Francisco	349.70	346.59	341.19	341.19	341.25	345.01	351.91	360.62	382.54	388.79	374.71	380.15	376.57	.....	San Francisco
Seattle	327.73	327.73	328.46	328.46	329.95	340.55	344.30	357.90	374.22	373.51	383.97	383.97	389.44	.....	Seattle
Montreal	314.08	316.33	315.24	315.94	315.94	313.65	316.65	316.65	345.66	344.76	362.71	377.64	384.56	.....	Montreal

These ENR Cost Indexes measure movements in the cost to contractors and engineers of construction materials and labor. They do not adjust for productivity. Where major differences between cities occur, the main reason is found usually in wage differentials. Lower wages are often accompanied by lower productivity, hence allowances for job productivity should be made in estimating end-product-price, or construction-selling-price trends based on the cost trends shown here.

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Other Building Cost Indexes

Cost indexes described on this page are shown on the accompanying charts, compared with the ENR Cost Indexes.

Building Cost Indexes, 1913 = 100

		1950						1951					
WEIGHTED	Orig. Base	Aver	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct
ENR Construction	1913=100	509	530	532	538	539	540	543	543	542	543	543	546
ENR Building	1913=100	375	391	393	398	399	400	401	401	400	400	400	403
American Appraisal:*	1913=100	500	517	523	524	525	527	528	531	535	535	...	...
Assoc. Gen. Contr.	1913=100	357	371	374	374	376	376	378	379	379	378	377	...
Boeckh, U. S. aver.	1926-29=100	386	402	408	412	413	413	415	415	415	416	...	...
Marshall & Stevens	1926=100	390	415	...	...	429	...	...	432	...	...	428	...
Smith, Hinchman & Grylls*	1926=100	426	457	461	467	470	478	478	478	474	474	476	...
ICCRR Sta & Off Bldgs	1910-14=100†	...	...	...	...	...	...	...	...	...	...	...	...
WR & A—RC Bldg Pac Div.	1911-14=100†	426	...	458	...	...	...	...	463	...	...	485	...
CONTRACTOR													
Aberthaw	1914=100†	321	339	...	...	357	...	...	373	...	...	374	...
Austin	1926=100	313	332	...	...	337	...	...	337	...	...	337	...
Fruin-Colnon	1926=100	398	422	424	426	426	429	431	433	433	435	435	...
Fuller	1913=100	377	...	398	...	...	405	...	...	405.5	...	...	...
Turner	1913=100	427	...	...	470	...	...	474	...	...	...	485	...

*Corrects for productivity. †Not converted to 1913=100.

Aberthaw Co., Boston, Mass. – Since March 31, 1946, a composite of 36 major cost items in three multi-story and two one-story New England industrial buildings, including all mechanical trades. Repriced quarterly using actual and estimated labor and material costs. Base: 1914 = 100. (Prior to March 31, 1946, based on New England seven-story and basement, 62'4" x 202'4", reinforced concrete building built in 1914.

American Appraisal Company, Milwaukee, Wis. – This index is based on detailed analysis of materials and labor required for four types of buildings (frame, brick, concrete and steel) in 30 representative cities. It is repriced monthly in accordance with: 1. prevailing wage scales and labor performance for the various building trades; and 2. quotations for construction materials in 30 key cities in the United States. The Index corrects for labor productivity but assumes normal average conditions and does not give any recognition to overtime or bonus payments to labor or premiums paid for materials in individual cases or under temporary abnormal conditions. It applies to construction only, does not include plumbing, heating, lighting, sprinklers, fixtures and decorations.

American Appraisal Company

Building Cost Index

Average and 22 individual cities, 1913 = 100

	1950		1951		
	Aver	Dec	Mar	June	Aug
U.S. Av., 30 cities	500	517	525	531	535
Boston	506	521	524	533	537
New York	513	536	542	545	545
Buffalo	513	526	536	551	552
Baltimore	517	533	538	543	544
Philadelphia	498	513	519	524	526
Pittsburgh	496	516	522	523	525
Cincinnati	480	496	503	506	511
Cleveland	504	522	532	536	537
Chicago	467	488	495	499	509
Indianapolis	506	521	527	528	541
Detroit	516	539	547	549	549
Milwaukee	513	531	536	568	568
Minneapolis	462	475	478	500	500
Kansas City	478	495	499	500	508
St. Louis	487	504	512	529	530
Atlanta	522	543	550	557	561
Dallas	461	475	480	482	482
New Orleans	509	525	529	531	537
Denver	453	471	476	479	481
Seattle	518	533	548	552	557
San Francisco	461	477	485	490	495
Los Angeles	488	502	514	519	518

Associated General Contractors of America (AGC), Washington, D. C. – Wages and materials for 12 cities combined in 40-60 ratio. Wages, prevailing rates for hod carriers and common labor. Materials, weighted: sand, gravel and crushed stone, 1; cement, 1; lumber, 1; hollow tile, ½; structural and reinforcing steel, ½.

Austin Co., Cleveland, Ohio.—Reprices typical one-story, steel frame, monitor type industrial building. Includes concrete foundations; brick curtain walls; continuous steel sash; concrete floor laid on ground; 2-in. wood roof deck on timber purlins covered with 4-ply waterproofing, monitor sash with mechanical operators, but no heating, lighting, plumbing, sprinkler or other services. Priced quarterly for central and eastern states. 1926 = 100.

E. H. Boeckh & Associates, Inc., Washington, D. C. – Current indexes are calculated upon an actual survey at source of local construction cost conditions. Material prices used are those paid by contractors to material dealers. Labor rates are current rates paid by contractors – certain corrections being made in certain areas for labor efficiency and labor shortage. Index includes construction overhead, sales taxes, compensation insurance and social security. Base 1926-'29 = 100. Special purpose indexes are reported for ten classes of buildings in 47 cities, August, 1951.

Where a Boeckh index is shown in these pages on charts with other building cost indexes, the national average for all five Boeckh commercial and factory building indexes is used, converted to 1913 = 100.

Fruin-Colnon Contracting Co., St. Louis, Mo. – Industrial plant of five buildings in St. Louis repriced monthly on basis of contractor's actual and estimated material and labor costs. 1913 = 100, 1926 = 100 both used as bases.

George A. Fuller Co., New York, N. Y. – Composite of 36 major cost elements, in three commercial type buildings, including mechanicals, elevators, wiring, heating and ventilating, repriced.

Marshall and Stevens, Inc. of Illinois, Chicago, Ill. – Indexes cover both comparative building costs, 1902 to date, and comparative equipment costs, 1913 to date. The building indexes are national averages with a system of modifiers to get regional and municipal values for each of four types of building. A. Fireproof, protected steel, B. Fireproof, reinforced concrete, C. Masonry buildings, D. Frame. They are designed to reflect normal costs in line with recognized or published prices of building materials, equipment and labor. Extraordinary or intangible conditions are not included. 1926 = 100 base is used. Composite building cost series is converted to 1913 = 100 where compared with other indexes in the charts.

Smith Hinchman & Grylls Inc., Detroit, Mich. – Actual in-place costs, using building material costs, freight rates, skilled and unskilled labor rates and including labor efficiency and premiums, bidding competition, contractor profit margins and overhead. Figured with the contractor overhead are taxes, duration of projects, material expediting and labor procurement. This is reported monthly on a 1926 base.

Turner Construction Co., New York, N. Y. – Eastern cities. Own cost experience on labor rates, material prices, productivity of labor, efficiency of plant, competitive conditions, forecast of price trends.

Railroad Construction Cost Indexes—Released annually, by Engineering Section, Bureau of Valuation, Interstate Commerce Commission, Washington, D. C., include items developed from analysis of major construction contracts over a period of years. Indexes for material accounts are based on studies of carriers' returns to Valuation Order 14, joint studies made with various sub-committees of President's Conference Committee, well-known engineering and trade publications, contracts covering major construction projects and other information furnished by individual carriers. 1910-1914=100. The series for stations and office buildings is used in the charts.

Handy-Whitman, Whitman, Requardt & Associates, Inc., Baltimore, Md.—See accompanying page for description and tables.